







*Macfay*

No. III.]

[PRICE 16s.

INVERTEBRATE  
ZOOLOGY  
*Brutaceos*

## ILLUSTRATIONS

OF THE

# ZOOLOGY OF SOUTH AFRICA;

CONSISTING CHIEFLY OF

FIGURES AND DESCRIPTIONS OF THE OBJECTS OF NATURAL HISTORY

COLLECTED DURING

AN EXPEDITION INTO THE INTERIOR OF SOUTH AFRICA,

IN THE YEARS 1834, 1835, AND 1836;

FITTED OUT BY

"THE CAPE OF GOOD HOPE ASSOCIATION FOR EXPLORING CENTRAL AFRICA:"

TOGETHER WITH

A SUMMARY OF AFRICAN ZOOLOGY,  
AND AN INQUIRY INTO THE GEOGRAPHICAL RANGES OF SPECIES  
IN THAT QUARTER OF THE GLOBE.

BY ANDREW SMITH, M.D.,

SURGEON TO THE FORCES, AND DIRECTOR OF THE EXPEDITION.

Published under the Authority of the Lords Commissioners of Her Majesty's Treasury.

## ANNULOSA.

BY W. S. MACLEAY, ESQ. M.A., F.L.S.,

HIS LATE MAJESTY'S COMMISSIONER AND JUDGE IN THE MIXED COURT OF JUSTICE

ESTABLISHED AT THE HAVANA.

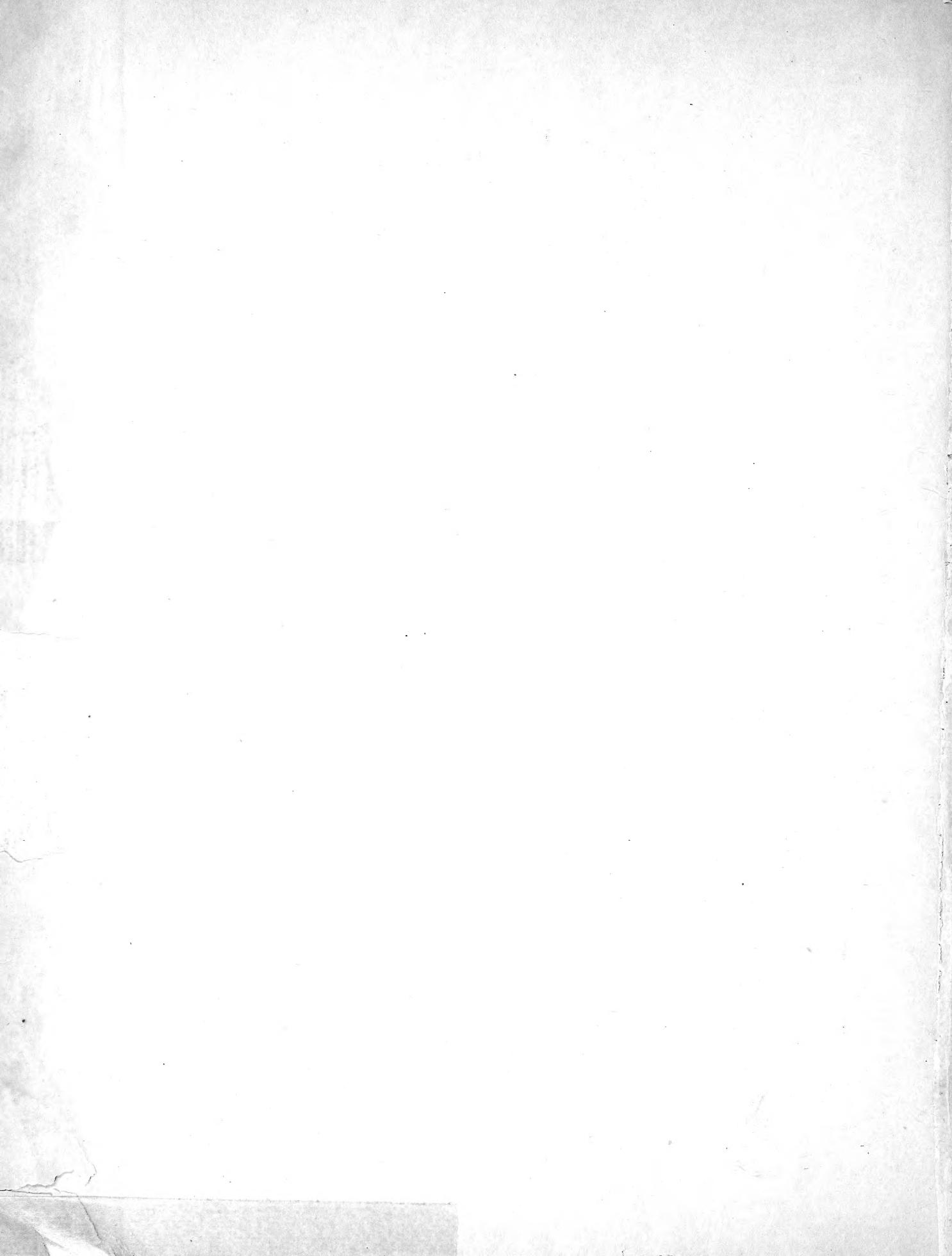


LONDON:

SMITH, ELDER AND CO. CORNHILL.

MDCCCXXXVIII.

1838



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BEING A PORTION OF THE OBJECTS OF NATURAL HISTORY

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## TO ZOOLOGISTS.

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At the request of my friend Dr. Smith, I have undertaken to lay before the public such Annulose forms collected by him in South Africa, as appear to be most worthy of notice. It may be well that I should mention here my having lately acquired, by purchase, the very extensive collection of *Annulosa* made by M. Verreaux during his long residence at the Cape, and also his manuscript notes on the species collected. Perhaps therefore no naturalist is better provided than I am with those materials which are necessary to enable us to form accurate notions of South African entomology. Upon this subject also, my personal acquaintance with the habits of many exotic genera, may to a certain degree be brought to bear.

In his descriptions of the vertebrated animals of the Cape, Dr. Smith has adopted a plan of publication, which is at once convenient for himself and for his readers. The subjects which he brings under the notice of naturalists, are by reason of their size and importance in the economy of nature, sufficiently interesting to entitle each species to a distinct plate and a long description. He can, therefore, publish each animal in the order that best suits his convenience, reserving for the conclusion his general arrangement, when his readers can either adopt it or bind up the work according to that system which may most please their fancy. I need scarcely say that the expense which would inevitably result from the adoption of any such mode of publication in the description of insects, renders it impossible for me to follow Dr. Smith's example. A whole plate devoted to a single species of annulose animal, would be obviously inconvenient for all parties, and to none more than to the purchasers of this work. It becomes therefore necessary to place several figures in one plate; the only valid objection to which plan is the difficulty of finally arranging the plates according to system, since each of them must necessarily contain figures of species that belong to very different groupes. This evil, however, I shall endeavour to avoid, by describing as far as

convenient, my species in small natural groupes, and by confining each plate as much as possible to the representation of species that are nearly allied to each other. Such a mode of proceeding, like that of Dr. Smith, will allow of the work, when concluded, being bound up according to that system of arrangement which may appear to the reader most advisable to follow.

I could wish that it had been in my power to describe these insects according to the general plan commenced in the *Annulosa Javanica*. Several circumstances, however, prevent such a scheme being followed, among which is the necessity in a work of this kind of each number possessing considerable variety. But although I am about to describe the *Annulosa* of South Africa in a miscellaneous order, I trust no one will detect symptoms of my being tormented by that morbid thirst for naming new species which makes so many modern works in entomology, rather magazines of undigested and insulated facts than harmonious histories of nature. It is really distressing to see the philosophy of our science lost sight of in a puling passion for that miserable immortality which is made to depend on the invention of some barbarous technical names. We cannot even say that the best entomologists are free from it, when we find the laborious author of the "*Genera Curculionidum*," whose fame has arisen from his study of nomenclature, shewing utter contempt of its laws. The preservation of the earliest name is a duty not so much to the name as to the science; yet M. Schönherr has in 1833, attempted to alter the names of many genera published in 1825 in the appendix to Captain King's voyage. I shall not follow so mischievous an example; but as far as my humble means will allow, I shall endeavour to be rigorously observant of that leading principle of nomenclature which is the right of priority. This right, in my opinion, is so necessary to be sustained, if we have any regard for the interests of natural history, that I shall never for one moment wait to consider whether the first namer of a species be an author of reputation or not.

W. S. M'L.

## I.—ON THE CETONIIDÆ OF SOUTH AFRICA.

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IN 1819 I distinguished a family of Petalocerous insects, under the name of *Cetoniidæ*, that had been originally marked out by Scopoli, as consisting of “*Scarabæi Anthophili*.” I shewed their affinity and analogies to the other Petalocerous families, and characterized the groupes by that membranaceous texture of the labrum and mandibles, which proves that these insects in their perfect state are intended to live on vegetable juices; very few exceptions to this general construction being known to exist in the family. I also described two or three new groupes belonging to the *Cetoniidæ*, but since that time many others have been named and characterized, particularly by MM. Lepelletier and Audinet de Serville, in the 10th volume of the Entomological part of the *Encyclopédie*, which was published in 1825. Mr. Kirby also, in a paper read before the Linnean Society, in 1824; and in a number of the Zoological Journal, published in 1827, has given to the world some valuable remarks on certain groupes of the family. But the work, which above all others, claims our present attention, is the “*Monographie des Cétoines*,” commenced by MM. Gory and Percheron, in 1833, and now, I believe, concluded. These gentlemen had the admirable intention of giving us in this work a complete description, with figures, of all the species of *Cetoniidæ*—that is, of the family as I circumscribed it in the *Horæ Entomologicæ*. The grand defect of their monograph is carelessness in the descriptions, in dates, and in names. Considerable reading and research was necessary for their undertaking; but these authors appear to me to have scarcely ever consulted any other entomological work than Count Dejean’s Catalogue. Although constantly referring to me, they do not seem to be acquainted with any thing I have written; nay, not even with that erroneous and somewhat piratical extract from my works, which in 1834 was printed in Paris, under the title of *Annulosa Javanica*. As for Mr. Kirby, they are entirely ignorant of his labours; and although they often in like manner make mention of his name, it is clear that they never read any of his instructive papers on the *Cetoniidæ*. Another great defect of this French monograph consists in the figures, which are only on a level with those of Olivier, and unaccountably bad, when we call to mind the beautiful entomological plates now in the course of publication in France by M. Guerin, and in our own country by Mr. Curtis. In short, the most praiseworthy circumstance connected with the *Monographie des Cétoines* is the intention of its authors. This it is which makes the book, with all its faults, a most useful work. It is truly the first entomological publication which has a right to be called a *monograph*; as it is not either a local catalogue, or the catalogue of one or two collections of a country, but professes to contain descriptions of all

the species which the authors could procure a sight of, whether in England, or on the continent. If it was a happy thought to undertake a catalogue of such extent, we the more regret the way in which the undertaking has been executed. In fact, MM. Gory and Percheron had every thing in their favor, except the acquirements necessary for the task. The subjects of their monograph are large, handsome, and easily preserved. They were therefore more likely to be brought from abroad than perhaps any other insects. The *Buprestidæ* are also handsome insects, but as the species of this family often are very minute, and always very active, so complete a collection of them is of more difficult attainment. Indeed, we may fairly say, that with the exception perhaps of Central Africa, the world contains of *Cetoniidæ* few species unknown, at least in comparison with those which are known. MM. Gory and Percheron appear never to have seen the noble collection made by my father; and if their work had been more ably executed, I should have deeply regretted my absence from England at the time they were studying the museums of our Metropolis. Nothing, however, affords me a better conception of the extent of their labours, than to see so few generic forms, and even species in my collection, which do not find their portraits, such as they are, in the *Monographie des Cétoines*.

It will be easily understood, therefore, why I now commence with the description of the *Cetoniidæ* of South Africa. It is not only because the Cape of Good Hope is the richest of all countries in the species of this beautiful family, but because every person who is in possession of the *Monographie des Cétoines* may, to a certain degree, have the power of studying analytically the affinities and analogies which I am about to explain, and of observing the manner in which, I trust, the whole of organized nature will one day be wrought out.

I have also another object in commencing with the *Cetoniidæ*, which is, that having been long sensible of the great confusion existing between the words *genera*, *sub-genera*, *sections*, *sub-sections*, &c. I am naturally anxious to explain the meaning of these words, as I shall in future use them.

Every one knows that sometimes sub-genera, and at other times even sub-sections of genera, are in the most unphilosophical manner published as genera. Too often we find every thing a genus which some gnathoclast, with Scapula in hand, has thought proper, in his good pleasure, to call so. Some persons again there are, who on a first inspection can oracularly decide that this groupe is a sub-genus, and that another groupe is of "full generic value." To such clearness of vision I can lay no claim; yet I cannot help thinking that there is a mode of discovering the true subordination of these several kinds of groupes — nay, I am sure this discovery will ever be the result of calm patience, of keeping before our view a great number of the species of any family, and finally of following up that aphorism of a distinguished botanist, which says, "Omnis sectio naturalis circulum, per se clausum, exhibet." When I described the *Geodephaga* of the *Annulosa Javanica*, I had not that knowledge of a sufficient number of the species, which was necessary to enable me to work out my subordinate groupes, and therefore I could only state that I did not exactly know which were genera; and which were sub-genera. If any one, for instance, were to publish a complete monograph of the Linnean genera *Carabus* and *Cicindela*, after the manner which MM. Gory and Percheron have adopted for the Fabrician genus *Cetonia*, it might be possible for the entomologist to distinguish the genera, sub-genera, sections, and sub-sections of *Geodephaga*, as well as to shew their reciprocal relations of affinity and analogy. That, however, which most tends to prevent young naturalists from taking this, the most honourable path of

entomological science, is impatience. It is impatience which makes them dislike the study of affinities, which makes them delight in the grovelling task of making insulated descriptions of new species, and idly fancy that harmony does not exist in the creation, because, forsooth, they cannot immediately and intuitively perceive it. To this branch of natural history, indeed, there is no royal road.

In order to exhibit the vagueness which hangs about the expressions — families, genera, and sub-genera, I cannot do better than cite from one of our late periodicals, the following words of an author: "These families which M. Wesmäel has since raised to sub-genera, but which I consider of full generic value," &c. Here, the dispute obviously is, whether a certain groupé be a family, a genus, or a sub-genus; and the first question that presents itself to the mind is, what was the writer's particular standard? He certainly seems to have had some vague standard in his mind, for he talks of "full generic value." But has this value ever been accurately defined, either by himself, or any one else? Nay, has the word *genus* any signification which is universally deemed definite? I fear in all such cases of assertion, there is a latent disposition of the human mind to erect an arbitrary standard, founded on the supposed value of some point of structure. Thus one person says that the genera of *Mammalia* ought to be established on the differences in their system of dentition; and yet there are some genera of *Mammalia* where almost every species varies in the number and form of its teeth; so that to adopt the rule, we must consider every species of such genera to be a genus itself. Another person will tell us, like Linneus, that there are as many genera, as aggregations of different species present similar constructions of some arbitrarily selected organs, such as those of fructification in phænogamous plants, or the teeth in *Mammalia*. In this sense it is evident that a genus may be made to signify any groupe whatever; as its extent will depend on the nature of the structure selected. The black and yellow *Cetoniæ* of South Africa will even form a genus, according to the Linnean definition of the word; and so also will all vertebrated animals. Cuvier's definition of a genus is, that it is a certain number of beings so nearly allied, that they differ from each other only in the least important points of their conformation — that is, *specifically*. A genus is, in fact, according to this naturalist, the smallest natural groupe of species we can find. Such indeed is the idea of a genus which prevails in the minds of most naturalists. We see every little groupe of species for which they can discover a character, immediately dubbed a genus; the absurdity of which is, that we often find these very same persons again sub-dividing their "genera," although, according to their own definition, the groupes were already in rank only immediately above species. Even Cuvier himself calls *Sus* a genus, or, in other words, according to his definition, a collection of beings that only specifically differ from each other. Yet, inconsistently enough, he proceeds to name and characterize a part of *Sus* under the name of *Dicotyle*, as a still smaller groupe of species, and repeatedly makes mention of sub-genera.

Let me be understood on this head. I do not object to giving the name of genera to sub-genera, nor that of sub-genera to sub-sections. The word *genus* may be applied as by Linneus to mark out all Petalocerous insects, or as by M. Dejean to designate only the *Dorysceles* of Madagascar. To either proceeding I have not the slightest objection; if we only understand each other, and that the word *genus* is to have a similar value in all cases. It is not to be defined the smallest possible groupe of species here, and in another place considered as a groupe which contains many other groupes of species. This cannot be a correct mode of using the word; although it may, from our ignorance of created species,

appear sometimes to be consonant with what we observe in nature. If we divide all animals into sub-kingdoms, classes, orders, tribes, stirpes, families, genera, sub-genera, sections, sub-sections, &c. &c. or any other names, we must not confound all these groupes together, but during our investigations, preserve each of them in that proper subordination which may have been agreed upon by naturalists. But here some one may observe that all groupes are arbitrary and artificial, since after all they must depend on the selection and good pleasure of man. To this I answer that affinities are natural; and if all these affinities are expressed by any mode of grouping, it follows also that the groupes must be natural; although, certainly, these last must in some degree have depended on our selection. But in fact, these groupes are only chosen because they coincide with the affinities which exist in nature. Our grand object, when we are trying to find out a natural arrangement, is not to give an arbitrary value to particular characters; but to express all the relations, whether of affinity or analogy, which may exist in the branch of natural history we study. If these relations are all indicated by the arrangement, our object is gained; and it can be no objection whatever to the system, that in our pursuance of an eclectic plan, a character which at one time we set a value upon, is at another time esteemed of little worth. Indeed, it is obvious in every part of natural history, that the most important characters break down in certain species, and become at times perfectly worthless. Comparatively constant as is the structure of the teeth in the genera of *Mammalia* generally, we find in some groupes, such as the *Edentata*, or the genus *Rhinoceros*, that the dentition varies extensively in almost every species. Again, in Botany, how steady is the *dicotyledonous* character of Exogenous plants; yet we have even this most important distinction breaking down in certain families. One naturalist arranges animals according to their brain and nervous system; another tells us, he prefers their osteology, and so on. Each point of structure, being of the utmost consequence to animal economy, is concluded by its peculiar partisan to be therefore infallible as a ground of arrangement. Very little experience, however, is sufficient to shew that each of these favorite hobbies is unsafe to ride upon; and we are in our search for an accurate way of expressing the relations which connect various beings, obliged to adopt another plan of calculating the value of principles of arrangement.

My plan, as is well known, has ever been not to estimate the value of any arrangement by the value in animal economy of the structure upon which this arrangement is founded, but to make the importance of every organ or structure for purposes of arrangement, rise in inverse proportion to its degree of variation. The consequence of this rule of procedure, has been the birth of an arrangement which is universally applicable. And yet, even this rule is nothing more than an abstract measure of the importance of some individual character in the arrangement of that particular groupe, where we may happen to make use of it. It is a rule, moreover, that we cannot always with safety put in practice; for although with respect to arrangement, it is ever an admirable instrument of correction, it is sometimes also a dangerous one of discovery. Indeed, in discovering natural arrangement, we can never safely swerve from the Linnean axiom, which although it alludes more immediately to "genera," holds good equally of all groupes; "Scias characterem non constituere genus sed genus characterem, et characterem non esse ut genus fiat sed ut genus noscatur." We truly make use of a process of *tattonnement*. We do not argue that such must be the groupe, because such and such are, in our opinion, good and distinct characters; but we say, such happens to be the character, of no matter what importance, which prevails throughout the groupe, and

which serves in some degree to insulate it from other groupes. But it is evident that we must previously have arrived at the knowledge of the groupe ; and this is effected by a close watching of the variation of affinity, and by considering the groupe to be complete only when the series of natural objects returns into itself. It is more particularly when we have satisfactorily applied this test of the groupe's completeness, that we ought to look out for its natural character. Still, after all, we may be wrong ; we may sometimes imagine a groupe to return into itself, when it does not ; or we may consider what in reality are two groupes, to form only one. The best way I know of correcting such evils, is to recollect that the natural system ought to express all the relations which exist between the various objects of our study, and that if any of these are left unrepresented in our arrangement, there must be some latent error, in the formation of our groupes. I repeat, that the process is one of *tattonnement*. The marsupial animals have clearly some kind of relation to *Primates*, to *Insectivorous Feræ*, to *Edentata*, and also to *Glires*. Now, if a naturalist cannot express all these relations, and at the same time all the various relations which exist among the other groupes of *Mammalia*, he ought to be convinced that his arrangement is wrong. It is of no use to talk about the importance of this organ, or of that other, in the structure of these animals. If even we were right in any such comparative estimate of the importance of organs in general economy, we ought not to forget that the true question under consideration is, the natural arrangement of the animals themselves ; and that this is to be attained only by the expression of every affinity, and every analogy that can be detected. The unnatural groupe *Testacea*, was founded on the important character of the presence of a shell ; and we shall see among the *Cetoniidæ*, that genera were erroneously separated from this family because they wanted its leading characters, which consist in the membranaceous texture of certain parts of the mouth.

I have before alluded to the fact, that when a series of affinity is followed, it is observed to return into itself, and thus to form a closed groupe. Now, if we start from the principle that when a few species *first* agree in some particular character, they combine into a series that will return into itself, we shall probably imagine every such series, so forming a circle in practice, to be in theory the first natural assemblage of species. Yet this will be an incorrect mode of viewing the matter ; for owing to the rarity of its species, the first known circular grouping of the species of *Cryptodinus*, for instance, is into sub-genera ; whereas the first known circular grouping of the species of *Cetoniidæ* is into certain sub-sections. But, if the above hypothesis were true, the sub-genera of one genus would be equivalent in value to only sub-sections of the other. I conceive, therefore, that in order to attain accuracy in the distinction of groupes, we must proceed in a totally different manner to investigate the subject. In the first place, we must commence from some given point in which all naturalists agree. Such a point undoubtedly is the animal kingdom. Every one acknowledges this groupe. Now I observe the animal kingdom to resolve itself into five natural groupes, forming a circle. I observe again, each of these circular groupes to resolve itself into five others, and so down, until I arrive at species. Now it is clear that I may term the animal kingdom a genus, or I may call the groupe *Vertebrata* a sub-genus, and *Mammalia* a kingdom ; the word given as a name to the class of groupe, being adopted for convenience, and being merely conventional. My aim is not to dispute about the propriety of the names given to these various groupes, but merely to express the proper subordination of one groupe to another, even supposing that they had no names. If, therefore,

I say that I will call the first five divisions of the animal kingdom, *sub-kingdoms* or *provinces*; the second 25 divisions of these, *classes*; the third 125, *orders*; the fourth 625, *tribes*; the fifth 3125, *stirpes* or *races*; the sixth 15625, *families*; the seventh number of circles, *genera*; the eighth *sub-genera*; and the ninth *sections*; and the tenth *sub-sections*, &c. &c.\* we shall obtain one general rule for the Annulose creation, and at least obtain the great advantage of understanding definitively what we are talking about. Theoretical, and to a certain degree artificial, as this view of the matter may be, it will assuredly tend to clear up our practice.

It may indeed be urged that difficulty occurs with respect to what are called insulated species. A *Cryptodinus* is more insulated than a *Cetoninus*, and an *Hippopotamus* than a mouse. This is true; but then I understand that the genus *Cryptodinus*, were it more perfect, ought to contain as many groupes of species as *Cetoninus* is known to do, and that to comprehend perfectly the affinities of a *Hippopotamus*, we must suppose it to be immediately surrounded with as many sections, sub-genera, and genera, as are known immediately to surround the mouse.

Thus, when the naturalist talks of any anomalous structure, I understand merely that so many links, that is, so many groupes, of the great plan of creation are wanting, as would connect this singular being with some other and better known form. If I say that the *Hippopotamus* forms a stirps by itself, I only mean that it is the sole species of its stirps known; and that, speaking theoretically, four families are wanting, or rather twenty-four genera to connect it well with the other tribes of Pachyderms. It is of no consequence whether the families and genera supposed according to this theory to be wanting, have disappeared, or whether they have never been created. I merely suppose them to be wanting, in order that I may obtain something like a just notion of the relation which the *Hippopotamus* bears to the other Pachyderms.

It will be seen on a review of the preceding remarks, that Cuvier's definition of a genus above given, most truly answers to what in the following observations on the *Cetoniidæ* I shall call sub-sections, or even to still smaller groupes, if any such can be pointed out; and that if genera are found to contain sometimes a few beings only specifically differing from each other, this results from our ignorance of certain sub-genera, sections, and sub-sections that are wanting. To those persons who may choose to give the name of genera to the entomological groupes which I call sub-sections, I have only to say that they ought to do it in all cases. They have no right to call the groupe named *Cetonia* by MM. Gory and Percheron, a genus, and also that which is termed by those gentlemen "*Dicheros*." I have avoided this confusion in entomology,† by invariably considering genera to be that sub-division of the animal kingdom which is the seventh in degree downwards; that is, to be the first sub-division of families.

In the same way that we discover confusion to proceed from that definition of genera which asserts them to be the next class of groupe above species, we shall also find a certain degree of confusion to proceed from the definition of the word *Family*, as depending on

\* Some persons have imagined that I only assign five species to the lowest groupe in nature; but the above theory evidently proceeds on the assumption that if we knew *all* the species of the creation, their number would be infinite, or in other words, that they would pass into each other by infinitely small differences. This actually takes place sometimes in nature; and as yet I do not know any good distinction between a species and what is called "a permanent variety."

† I suspect that genera among the *Vertebrata* may, from the comparative paucity of species, conveniently be considered as standing one degree higher in the scale, or in other words, that we may in that sub-kingdom, neglect the use of the word *stirpes*.

the above awkward one of *genera*. A *family*, in entomology, is held to be the next groupe in rank above *genera*; as, indeed, I myself consider it. I only differ from others in the value of the word *genera*. What, for instance, is the consequence if Cuvier's definition of genera be adopted? A most natural groupe has been marked out, and distinguished under the name of *Cetoniidæ*. In process of time some naturalist discovers within it other combinations of groupes which he considers *genera*, because, so far as he knows, they are the first groupes of species. *Gnorimus*, for instance, is such a groupe of species. Our naturalist forthwith calls it a *genus*: and he observes, that a number of such genera combine to form another groupe, which he calls *Trichiidæ*. Of course, he makes this combination of "genera" a family; and knowing that it cannot possibly be of the same rank as the original family of which it only forms a part, he is obliged to change the name of this from *Cetoniidæ* to *Melitophilæ*. It is thus that we have now every day such "families" formed as *Sericidæ*, *Diplotaxidæ*, &c., excellent groupes perhaps in themselves, but which their authors have been led away by a mere love of changing names, to consider as equivalent in rank to true families, such as *Trogidæ* and *Rutelidæ*. Any person gifted with a pair of eyes can analyse. The difficulty is to employ synthesis. In botany, every fraction of the ancient families has in like manner been also called a family, and the consequent confusion arrived at such a pitch, that Bartling and Lindley have lately been obliged to attempt the re-grouping, if I may so express myself, of the modern small "families" of plants. I have in the following observations on the *Cetoniidæ*, also endeavoured to avoid this confusion, and to preserve consistency; first, by considering such new-fangled families, as the "*Trichiadæ*," "*Sericidæ*," "*Diplotaxidæ*," "*Goliathidæ*," &c. to be only genera or sub-genera, containing minor groupes of species; and, secondly, by keeping them in proper subordination to their original families, the *Cetoniidæ*, *Melolonthidæ*, &c. These last, as families, I also agree to be the next groupes above genera, once that I have conveniently defined families to be the sixth degree of groupe downwards from the animal kingdom. Having said this much, I am ready to allow in behalf of those who are so fond of imposing new names on the science, at whatever expense of confusion, that if, for instance, a sub-section of *Goliathus* like that which is called *Mecynorrhina*, by my friend Mr. Hope, be considered a genus, it follows, that the next groupe above it, and of which *Mecynorrhina* forms a part,—viz. the groupe which I call *Smithii*, may, without blame, be called a family. But then such a family would be the ninth degree of groupe downwards from the animal kingdom.

In order to exhibit clearly the place of the *Cetoniidæ* in nature, I shall now give the following series of groupes.

*Regnum, ANIMALIA.*

1. *Subregnum, ANNULOSA.*
2. *Classis, MANDIBULATA.*
3. *Ordo, COLEOPTERA.*
4. *Tribus, CHILOGNATHOMORPHA.*
5. *Stirps, PETALOCERA, THALEROPHAGA.*
6. *Familia, CETONIIDÆ.*

Although I observe that of late various entomologists of great reputation have been designating families without venturing to give characters to them, I shall not follow their example; since I consider no name of the least weight that has not some character attached to it, enabling us to discover the accurate limits of the groupe which that name designates. It may be true that we have not always the good fortune to alight on the

real character which insulates the groupe, but this is a venial defect, into which every naturalist is, at times, liable to fall. Mr. Vigors, for instance, discovered and pointed out the natural groupe of *Insessores* among birds; but their true characteristic was not known until I observed that these are the only birds which have "callow" young.

### Fam. CETONIIDÆ, *Mihi.*

*Antennæ* of ten joints (very rarely nine), terminating in a triphyllous club composed of the three last joints.

*Labrum* compressed, generally membranaceous, often emarginate, with rounded corners, and always concealed under the clypeus.

*Mandibles* in general compressed, and furnished on the inside at the base with a subquadrate membrane, while the base and produced outer side are corneous.

*Maxillæ* corneous, and rather of a prismatic form, having their inner side often membranaceous, and fringed with hairs, but sometimes corneous, and armed with teeth.

*Maxillary Palpi* of four joints, the first joint being often evanescent, and the last never compressed.

*Labium* and *Mentum* more or less confluent, sometimes completely so; and the *mentum* is anteriorly truncated or emarginated, but never trilobed.

*Head* often subquadrate. *Body* always winged, and in general depressed. *Feet* in general slender, with the fore tibiae for the most part dentated, more particularly in the females. *Tarsi* pentamerous, terminating in two equal sharp undivided claws, between which often intervene a plantula and pseudonychia.

1. This family consists, to my knowledge, of more than 600 species, of which only five are natives of Great Britain. The groupe has been most erroneously characterized by MM. Gory and Percheron. These gentlemen distinguish the "Scarabées Mélitophiles,"—a name, be it observed, which although Latreillian, is very erroneous,—by the mandibles being rudimentary, or even by these organs of the mouth being altogether absent. A description so anomalous of *Cetoniidæ*, in a work entirely devoted to them, is not very creditable to these gentlemen as entomologists; since I need scarcely say, that the mandibles are never absent. True it is that in general these organs are compressed, and often even extremely thin and membranaceous; but sometimes again, as in the *Macroma scutellaris*, G. P., and *Cryptodus paradoxus*, M'L., &c. the mandibles and maxillæ are as solid, thick, and corneous, as in any Melolonthidous insect of equal size.

2. The *Cetoniidæ* pass off to the *Glaphyridæ* on one side, and to the *Rutelidæ* on the other. Those species of the sub-genus *Trichius*, which Mr. Kirby has called *Archimedii*, shew us that by the *Trichius lineatus*, Fab. (*Lepitrix lineatus*, Lp. Sr.) an insect of the Cape, we may arrive among the *Glaphyridæ*; and Mr. Kirby has, by the description of his genus *Cnemida*, explained to us how we may also pass from *Macroma* to the family of *Rutelidæ*. While on this subject, I may express my regret that an entomologist so distinguished as M. Dejean, and who has merely named this and other species in his catalogue without describing them, should have endeavoured to set aside the name *Cnemida Curtisi*, which Mr. Kirby has given with a description. The right of priority in entomology is usually held sacred, yet *Cnemida Curtisi*, K. is called *C. crassipes* by Dejean without any assigned reason. It is unfortunate for Mr. Kirby that he should so often have set the example of reckless change to foreigners.

3. Mr. Kirby, in the 14th volume of the Linnean Transactions, following perhaps an opinion I had thrown out on the *Horæ Entomologicae*, appears to consider *Chasmodia*, M'L., to be close in affinity to the *Cetoniidæ*. But the relation of *Chasmodia* to *Lomaptera*, G. P., is one of analogy: the two groupes being corresponding points of contiguous families. Both are pollinivorous groupes, agreeing in brilliancy of colour, and in their cleft clypeus; but in no essential respect are they so constructed that they can be brought close together in affinity.

4. In some species of the *Cetoniidæ* the tergum of the prothorax (which shall, in my observations on this family hereafter, be generally called *thorax*, for convenience and in conformity to the vulgar notion) is apt to have the middle part produced behind into a laminar lobe, which covers the scutellum in a greater or less degree. In proportion as this structure occurs, we always find the insect to be more sluggish and inactive. Thus the insects which compose the American subgenus *Gymnetis* are incomparably more sluggish in their habits than our European *Cetonia*.

5. M. Dufour has given us the anatomy of the perfect insect of the well-known English species *Cetonia aurata*, Fab.; and Professor Dehaan has favoured us with the anatomy of its larva. I shall in this place only observe, that the internal anatomy of the insects of this family is subject to greater variation than their external anatomy; and it must therefore be more distrusted in classification, according to the principles I have ventured to lay down in the 14th volume of the Linnean Transactions.

6. In the following enumeration of the various groupes into which the *Cetoniidæ* have been broken up, I shall endeavour to be strictly just in assigning them to their proper discoverers. From the respect due to the labours of my predecessors, I shall try to retain every name that has been published; but I would have it here clearly understood, that the name of the author annexed to a technical word does not always signify that he invented that name, but rather indicates the particular value given by that person to the groupe. Thus, for instance, *Trichinus*, Fab., will indicate the groupe called *Trichius* by Fabricius; and *Trichius*, M'L.; the value given to the Fabrician name by myself. The discoverer of a natural groupe may have some merit, but the mere inventor of a name has really none. On this principle, therefore, I have generally acted; and more particularly when, in order to distinguish genera from sub-genera, I have given the former a termination always in *inus*.

### Genera.

<i>Aberrant Groupe.</i>		
Larva having its mandibles unidentate towards the extremity.	1 TRICHINUS, Fab. 2 CRYPTODINUS, M'L. 3 MACROMINUS, M'L.	Terminal process of maxillæ always furnished with a brush but not with teeth. Epimeron never prominent between angles of thorax and elytra. Terminal process of maxillæ never furnished with a brush, but always dentated. Epimeron never prominent between angles of thorax and elytra. Terminal process of maxillæ generally furnished with a brush and always with teeth. Epimeron always distinct between angles of thorax and elytra.
<i>Normal Groupe.</i>		
Larva having its mandibles pluridentate towards the extremity.	4 GYMNETINUS, K. 5 CETONINUS, M'L.	Thorax lobate behind in the middle, and covering the whole scutellum more or less with the lobe. Thorax not so lobate behind, and leaving the whole scutellum always distinct.

7. I term these *genera*, because they are the first class of groupes into which the *Cetoniidæ* resolve themselves. They form a series returning into itself. Some persons may call them sub-families, or give them any other name. This is quite a matter of taste; but I choose to call them genera, in order that I may more easily hereafter shew the relation borne to each of them by the groupes of modern entomologists. Of these genera then, *Trichinus* appears to have been discovered by Fabricius, and to answer tolerably well to his genus *Trichius*. I have therefore assigned the groupe *Trichinus* to him, because *Trichius* denotes, with modern authors, a groupe of more limited extent. *Cryptodinus* and *Macrominus* are groupes now, I believe, for the first time, clearly pointed out, although the former nearly corresponds with what Gory calls his genus *Cremastocheilus*. I have assigned the groupe *Gymnetinus* to Kirby, because it answers very nearly in extent to the sub-family called by him *Gymnetidæ*, and by Gory *Gymnetides*. *Cetoninus* is a groupe which I am not aware has ever until now been properly distinguished.

8. I am acquainted with larvæ of the genera *Trichinus*, *Gymnetinus*, and *Cetoninus*; but I believe no larva of *Cryptodinus* or *Macrominus* is as yet known. It is probable, however, that the larvæ of these last, when discovered, will be found to have the mandibles formed like those of the larvæ of *Osmoderma eremita*, that is, unidentate at the extremity; for they are insects which have great affinity to each other in the manners of their perfect state.

9. I have attempted in the above table to distinguish the normal groupe by its larva; but it may also be not badly distinguished by the imago, which has the terminal process of the maxilla almost always without teeth, and, at the same time, the epimeron almost always apparent between the angles of the thorax and elytra. By the first of these characters the normal groupe may be separated very nearly from the genus *Macrominus*, and by the latter very nearly from the genus *Trichinus*. There are exceptions to the rule, such as *Philistina* and a section of *Goliathus*, which have maxillæ with corneous teeth, and *Inca*, which has the epimeron not apparent between the thorax and elytra; but these are osculant groupes, the former leading to *Macrominus*, and the latter to *Trichinus*.

10. Of the five British species that belong to the family of *Cetoniidæ*, three are to be assigned to the genus *Trichinus*, and two to *Cetoninus*. But no one who confines his attention to the above five species can form any notion of the beauty and variety of form that prevails throughout the family.

11. I do not venture to alter the terminations of the sub-genera, in order that they may agree with that of the genus to which they belong; nor can I make the terminations of the genus apply to that of all the sub-genera which it contains. The consequence of this is, that we have often strange concords, such as *Trichinus Platynenia Zairica*; but in such cases I have always made the trivial name agree with the sub-genus rather than with the genus. To this last I have given the termination, which corresponds with that of the majority of the sub-genera.

#### *Genus I. TRICHINUS*, Fab.

12. This genus is easily known from *Cryptodinus*, M'L. by its flat mentum and maxillæ provided with a brush of hairs; while from the genus *Cetoninus*, it is separated by its never having the epimeron prominent between the thorax and elytra, as well as by the anterior femora having no spines at their junction with the tibiæ. I do not place so much confidence in Latreille's character drawn from the mode in which the labial palpi are inserted.

13. In this genus, generally, the terminal brush of the maxilla is inserted in the triangular orifice of a short triangular corneous process, which terminates the maxilla, and appears articulated to it. In some of the floral species, this pencil of hairs or brush is very long, and admirably calculated for sucking up the honey of flowers; but in other sub-genera, such as *Platygenia* for example, the terminal brush may rather be considered to line the edge of the small triangular corneous process which terminates the maxilla and appears articulated with it. In such insects this process of the maxilla is not so palpiform as in those *Trichini* which inhabit flowers.

14. The larva and metamorphosis of the sub-genus *Trichinus* have been perfectly well explained by Professor Dehaan of Leyden, who shews that they bear more similarity to those of *Glaphyridæ* and *Melolonthidae*, than to those of the sub-genus *Cetonia*. This is a curious fact, and strongly illustrative of the danger attendant on our assuming a method of division instead of following the mode of variation. What groundwork for a natural division, for instance, appears more natural than metamorphosis? Certainly none; and yet if we divide the family of *Cetoniidæ* by this rule, we shall place half of the contents along with the genus *Melolontha*! If, on the other hand, we follow the maxim of variation, and watch how the metamorphosis changes, we only arrive at the fact, that *Trichinus* (i. e. an aberrant genus of *Cetoniidæ*) is intermediate between the *Glaphyridæ* and the typical *Cetoniidæ*, inasmuch as it has the larva of the former, and the imago of the latter.

But we proceed to detail the various sub-genera of *Trichinus*. Fabricius was not acquainted with the singular insects which compose the first of them.

### Sub-genera.

A.—Body depressed and sides thin.	<i>PLATYGENIA</i> , M'L.	Anterior tibiae externally bidentate.
First joint of maxillary palpi distinct.	<i>CAMPULIPUS</i> , K.	Anterior tibiae externally tridentate.
	<i>TRICHIUS</i> , M'L.	Anterior tibiae externally bidentate in general. Body covered with hairs or scales.
B.—Body and sides thick. First joint of maxillary palpi evanescent.	<i>VALGUS</i> , Sc.	Anterior tibiae externally multidentate. Body spotted with scales.
	<i>OSMODERMA</i> , Lp. Sr.	Anterior tibiae externally tridentate. Body depressed, without hair or scales.

#### Sub-genus 1. *PLATYGENIA*, M'L.

15. Of this sub-genus only one species is certainly known; although, to say the truth, Gory's figure of what he calls *Platygenia Zairica*, is so unlike the insect which I so named some years ago, that one is almost inclined to believe he may have fallen accidentally upon a new species of the group. Indeed, I consider the *Trichius barbatus* of Schönerr to belong certainly to the sub-genus. The mouth of *Platygenia* approaches very near in structure to that of *Osmoderma*, however different it may seem in external appearance. It is in fact, the mouth of an *Osmoderma*, with all the parts flattened, and excessively widened, differing only in having the terminal lobe of the maxillæ transversal and small. I imagine, indeed, that the true character of this sub-genus is founded on the comparative evanescence of the palpiform terminal process of the maxillæ.

16. The general form of the thorax of *Platygenia*, and its very depressed body, make me think that we can proceed from it to *Campulipus*, by means of some sections hitherto

unknown. M. Latreille perceived this affinity; but we only know one section of *Platygénia*, and consequently, must reckon several forms wanting before we can closely connect it with *Campulipus*. Both are sub-genera peculiar to Africa.

*Sub-genus 2. CAMPULIPUS*, Kirby.

17. This groupe agrees with the last, and differs from all the other sub-genera of *Trichinus* in having its body depressed, and the four joints of the maxillary palpus distinct. The elytra also nearly cover the podex, and the terminal process of the maxilla is very long, so as sometimes to resemble that of a bee. These are most likely floral insects. The following sections appear to be known.

*SECTIONS OF CAMPULIPUS.*

A.—Body depressed. Intermediate tibiæ incurvated in one sex.	$\left\{ \begin{array}{l} 1 \text{ AGENII, Lp. Sr.} \\ 2 \text{ STRIPSYPHERI, G. P.} \end{array} \right.$	Clypeus entire. Clypeus bifid.
B.—Body more convex.	$\left\{ \begin{array}{l} 3 * * * * \\ 4 \text{ MYODERMI, Dej.} \\ 5 \text{ ZEBRÆI, M'L.} \end{array} \right.$	Clypeus not simple. Clypeus simple.

18. I have given the credit of this sub-genus to Mr. Kirby, but in fact his *Campulipus* is a groupe which only answers to the normal groupe of this sub-genus as above characterized. Mr. Kirby first observed *Trichius limbatus* of Olivier to be distinguished from its congeners by the remarkable intermediate tibiæ, which are curved into an obtuse angle, and appear thus as if broken. This character, however, is still more developed in an undescribed species in my collection, of M. Gory's singularly-named genus\* *Stripsypher*, which species I shall here call *Campulipus incurvatus*. It is black, with yellow elytra, having four square black spots. This incurvation of the intermediate tibiæ appears to be a sexual character, for I possess a specimen of *Campulipus limbatus*, without this distinction being strongly marked. Of the section *AGENII*, we have the following from the Cape.

Sp. 1. (Trichinus) *Campulipus limbatus*, Ol.

*Agenius limbatus*, G. P. p. 95. tab. 11. fig. 4.

NOTE. I may here remark that the figure of the mentum and maxilla of *Agenius limbatus* as given by Gory is all wrong. The mentum comes much nearer to that of his groupe *Stripsypher*, and the maxillæ in both sections have a long penicilliform terminal process.

Sp. 2. (Trichinus) *Campulipus Horsfieldii*, n. s.

DESCR. *Campulipus afronitidus*, punctatus, clypeo quadrato, thoracis lateribus albo-marginatis, scutello punctis duobus albis, elytris puncto-substriatis vittis duabus mediis abbreviatis maculâque utrinque ad scutellum flavis: punctis quatuor discalibus quatuor que lateralibus albis.

*Antennæ testaceæ clavâ piceâ. Corpus infra nigronitidum. Podex punctis quatuor, abdomen quinque lateralibus et epimeron maculâ semicirculari albis. Pedes picei, tibiis posticis postice emarginatis.*

LONG. 7 lines.

NOTE. *Campulipus Horsfieldii* is a beautiful species which appears to connect the two sections, *AGENII* and *STRIPSYPHERI*. *Stripsypher niger*, G. P. a Cape insect, truly belongs to the section *STRIPSYPHERI*. Yet, while the *Agenii* belong truly to Southern Africa, the *STRIPSYPHERI* are found more in the intra-

\* What Gory intends by this word I know not.

tropical regions of that vast continent. As to the section which I have named *MYODERMI*, and which corresponds with the genus *Myoderma* of Dejean's Catalogue, I only know it by M. Gory's bad figure and worse description of "*Stripsypher sordidus*," which comes from Senegal.

Of the section *ZEBRAEI* we have one species at the Cape.

Sp. 3. (*Trichinus*) *Campulipus Zebra*, *Klug.*

*Stripsypher Zebra*, G. P. p. 98. tab. 12. fig. 1.

NOTE. I may here observe that the *Stripsypher* called by Gory in his text the *S. bimaculatus* of Schönher, and in his plates *S. 6-maculatus* is neither. It is called by Schönher *Trichius 6-guttatus*.

#### Sub-genus 3. TRICHIUS, M'L.

19. This may be known from *Campulipus* by having a much shorter palpiform process to the termination of the maxillæ, as well as by the podex being in general more covered by the elytra. It has also a more convex form, and thus it may be distinguished from the sub-genus *Valgus*, as well as by its longer elytra. *Trichius* haunts flowers, and may be found in Great Britain. It is the sub-genus which passes off to the *Glaphyridæ*.

#### SECTIONS OF TRICHIUS.

B.—Terminal lobe of the maxillæ provided with a short pencil of hairs.	<table border="0"> <tr> <td>1 <i>LEGITIMI</i>, M'L.</td><td>{ Body hirsute above and below. Last joint of maxillary palpi grooved. Inhabit Europe and America.</td></tr> <tr> <td>2 <i>ALEUROSTICTI</i>, K.</td><td>{ Body only hirsute on the under side. Last joint of maxillary palpi rather grooved. Inhabit Europe and North America.</td></tr> <tr> <td>3 <i>GEOMETRICI</i>, M'L.</td><td>{ Body clothed with scales. Last joint of maxillary palpi not grooved. Inhabit America.</td></tr> </table>	1 <i>LEGITIMI</i> , M'L.	{ Body hirsute above and below. Last joint of maxillary palpi grooved. Inhabit Europe and America.	2 <i>ALEUROSTICTI</i> , K.	{ Body only hirsute on the under side. Last joint of maxillary palpi rather grooved. Inhabit Europe and North America.	3 <i>GEOMETRICI</i> , M'L.	{ Body clothed with scales. Last joint of maxillary palpi not grooved. Inhabit America.
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A.—Terminal lobe of the maxilla provided with a long pencil of hairs.	<table border="0"> <tr> <td>4 * * * *</td><td></td></tr> <tr> <td>5 <i>TETROPHTHALMI</i>, K.</td><td>{ Canthus almost bisecting the eyes. Last joint of maxillary palpi grooved. Inhabit Africa and Asia.</td></tr> </table>	4 * * * *		5 <i>TETROPHTHALMI</i> , K.	{ Canthus almost bisecting the eyes. Last joint of maxillary palpi grooved. Inhabit Africa and Asia.		
4 * * * *							
5 <i>TETROPHTHALMI</i> , K.	{ Canthus almost bisecting the eyes. Last joint of maxillary palpi grooved. Inhabit Africa and Asia.						

20. Under the name of "LEGITIMI," I have included Mr. Kirby's two sections, "*Legitimi*" and *Trichini*, which last he now terms a sub-genus. The evanescent difference between these two groupes of the reverend gentleman appears to be of a very low order, and probably, therefore, only indicates sub-sections. Indeed, it chiefly consists in his *Trichini* being nitid and æneous, and his *Legitimi* not. However, Mr. Kirby thinks he can discover some slight difference in the last joint of the palpi. The type of the section I have termed *LEGITIMI* is the well-known *Trichius fasciatus* of Fabricius. Mr. Kirby makes the type of his section *ALEUROSTICTI* to be *Trichius nobilis* of Fabricius. This last section is, therefore, identical with the groupe called *Gnorimus* in the "*Encyclopédie*," by MM. Lepelletier and Serville.

21. Under the name of *GEOMETRICI*, I have included Mr. Kirby's two sections *Archimedii* and *Enclidii*, because there is, in my opinion, no sufficient difference between them to entitle them to be made distinct sections of the sub-genus. They may, however, ultimately prove to be distinct sub-sections of the section *Geometrici*. I consider the type of the *Geometrici* to be *Trichius delta* of Fabricius.

22. Of the section *TETROPHTHALMI*, as distinguished by Kirby, we have among the insects collected by Dr. Smith, the following species.

Sp. 4. (*Trichinus*) *Trichius vittatus*, *Fab.*

*Trichius vittatus*, G. P. p. 83. tab. 9. fig. 5.

Sp. 5. (*Trichinus*) *Trichius suturalis*, *G. P.*

*Trichius suturalis*, G. P. p. 84. tab. 9. fig. 6.

*Sub-genus 4. VALGUS*, Scriba.

23. This answers to the genus *Acanthurus* of Kirby, easily known by its depressed form, long trapezoidal prothorax, and short elytra. In the only section of this sub-genus which I know, there is a mucro arming the anus in one of the sexes, and which is probably the ovipositor. I have always found the species of *Valgus*, either at the roots of trees, or at the foot of walls, but never on flowers as Latreille says that he has found them. The section *Geometrici* of the last sub-genus is covered with scales, and so is this sub-genus; but we still want some sections of *Valgus* to connect the *Geometrici* with the common *Trichius hemipterus* of Fabricius. Indeed, I am not aware that the present sub-genus has ever been resolved into sections. There is one species at the Cape, viz.

Sp. 6. (*Trichinus*) *Valgus Smithii*, n. s.

DESCR. *Valgus* thoracè postice utrinque maculâ nigrâ abdominisque fasciâ albâ.

LONG. Corp. 4 lines.

NOTE. This species is scarcely distinct from the *Valgus hemipterus* of Europe. It has the same rugæ of the thorax, the same size and general form, and only differs slightly in the disposition of the scales. In *V. hemipterus* for instance, the abdomen is quite white with thickly set scales. In *V. Smithii* there is merely a white band. *V. Smithii* has also a white mark in the black lateral spot of the thorax. But in truth these species come very near to each other.

*Sub-genus 5. OSMODERMA*, Lp. Sr.

24. This groupe has been hitherto described and figured with little care. It is said to have the terminal lobe of its maxillæ corneous. This lobe is not, however, more corneous than in any of the other sub-genera of *Trichinus*. It is an elongated hollow triangle, filled with a short thick pencil of hairs. The true characteristic of the sub-genus is the strong corneous hook which arms the maxillæ on its inner side. These insects live with their larvæ in rotten wood. They have been called *Gymnodi* by Mr. Kirby, and made by him part of his genus *Trichius*. I am acquainted with two sections of *Osmoderma*, which are peculiar to Europe and North America. The type is *Trichius Eremita* of Fabricius. I have already said that, different as *Platygenia Zairica* is in aspect from all the other known species of the genus *Trichinus*, it comes in every essential respect exceedingly close to *Osmoderma*. I suppose the name given by Lepelletier and Serville to this sub-genus, alludes to the scent of Russia leather, which the European species *O. Eremita* emits when it is handled.

*Genus II. CRYPTODINUS*, Mihi.

25. We have seen that none of the known species of the genus *Trichinus* have the terminal lobe of their maxillæ furnished with teeth. The sub-genus *Osmoderma*, was indeed supposed to possess this structure, but erroneously; although it has certainly a tooth at the point of the inner process. This formation appears to prepare us for the maxillæ of the present genus *Cryptodinus*, of which the character is always to have a corneous tooth or teeth on the terminal process. Indeed, that tooth which *Osmoderma* possesses on the inner process of the maxillæ, brings it, of all the sub-genera of *Trichinus*, the nearest to the genus *Cryptodinus*. This genus may be always known by its depressed elongated form, and by the under side of the mentum having a process, while the outer side of the terminal process of the maxilla has no brush. *Cryptodini* are found in all the principal divisions of the globe, Europe excepted. They are nevertheless chiefly intratropical insects, which are

great lovers of sand on the banks of rivers, and so far as my observation has gone, they are not authobious. This genus is nearly the same in extent as the genus *Cremastocheilus* of Gory and Percheron, and is easily known by the first joint of the antennæ being large, triangular, and broad. I am acquainted with the following sub-genera.

### Sub-genera.

B.—Clypeus not plain and not semicircular.	<table border="0"> <tr> <td style="vertical-align: top; padding-right: 10px;">1 CREMASTOCHEILUS, Kn.</td><td style="vertical-align: top; padding-left: 10px;">Prothorax quadrate, with the angles acute. Vertical process of mentum hollow, oval, pelviform. Fore tibiae bidentate. North America.</td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">2 CYCLIDIUS, M'L.</td><td style="vertical-align: top; padding-left: 10px;">Prothorax orbicular. Vertical process of mentum triangular and hollow. Fore tibiae bidentate. South America.</td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">3 GENUCHUS, K.</td><td style="vertical-align: top; padding-left: 10px;">Prothorax subquadrate, with sides and angles rounded off. Vertical process of mentum triangular and flat. Fore tibiae tridentate. Africa.</td></tr> </table>	1 CREMASTOCHEILUS, Kn.	Prothorax quadrate, with the angles acute. Vertical process of mentum hollow, oval, pelviform. Fore tibiae bidentate. North America.	2 CYCLIDIUS, M'L.	Prothorax orbicular. Vertical process of mentum triangular and hollow. Fore tibiae bidentate. South America.	3 GENUCHUS, K.	Prothorax subquadrate, with sides and angles rounded off. Vertical process of mentum triangular and flat. Fore tibiae tridentate. Africa.
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A.—Clypeus plain semicircular.	<table border="0"> <tr> <td style="vertical-align: top; padding-right: 10px;">4 CYMOPHORUS, K.</td><td style="vertical-align: top; padding-left: 10px;">Antennæ ten-jointed. Anus with spines. Elytra with lobate shoulders.</td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">5 CRYPTODUS, M'L.</td><td style="vertical-align: top; padding-left: 10px;">Antennæ with nine-joints. Anus without spines. Elytra with parallel sides. New Holland.</td></tr> </table>	4 CYMOPHORUS, K.	Antennæ ten-jointed. Anus with spines. Elytra with lobate shoulders.	5 CRYPTODUS, M'L.	Antennæ with nine-joints. Anus without spines. Elytra with parallel sides. New Holland.		
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26. All the foregoing five sub-genera agree in the clypeus having a reflexed margin in front. They agree also in the curiously dilated triangular scape of the antennæ, and in the epimeron not being prominently distinct between the thorax and shoulders of the elytra.

#### Sub-genus 1. CREMASTOCHEILUS, Knoch.

27. This groupe answers to the genus *Cremastocheilus* of Knoch, Latreille, and Kirby; but it is here reduced to its proper rank, that of a sub-genus only. It differs from the other *sub-genera* in having the vertical process of the mentum hollow, and basin-shaped, while the terminal process of the short maxilla, is a straight blunt tooth, and the inner process is a sharp minute tooth surrounded with a few hairs. These insects are North American, and differ in their manners from the *Cetoniidæ* in general, but probably agree in this respect with all the other sub-genera of *Cryptodinus*. The species of *Cremastocheilus* are not common. In company with Dr. Pickering, and Mr. Titian Peale, I found *C. castaneæ* of Knoch, in June, 1836, on the banks of the Delaware, on the new Jersey side, opposite to Philadelphia. These singular beetles are never found except flying, like *Cicindelæ*, over the sand which there lines the bank of that noble river. They are certainly not flower-frequenting insects, and what they find in the sand to their taste I do not know. Mr. Kirby has made some good remarks on this sub-genus in the third volume of the Zoological Journal; only without giving any sufficient reason for so doing, he has termed that part the *labium* which Latreille has called the *mentum*. I am not acquainted with the sections into which *Cremastocheilus* may be divided.

#### Sub-genus 2. CYCLIDIUS, M'L.

28. To this groupe belongs *C. elongatus* of Olivier, and *C. axillaris* of Dupont. I shall add another species which stands in my cabinet as *C. Nero*. It is as large as *Platygenia Zairica*, and of a velvety black hue, with two large long nitid and blood-coloured spots in the middle

and towards the apex of the smooth and perfectly flat elytra. It is the giant of the genus *Cryptodinus*. The sub-genus *Cyclidius*, appears to be peculiar to South America.

*Sub-genus 3. GENUCHUS*, Kirby.

29. MM. Gory and Percheron do not adopt this groupe, and in their usual self-sufficient way, state that I first separated it from *Cremastocheilus*, and that I have erroneously characterised it. To this I answer, that never until now, have I published a word on the subject. It is true that Mr. Kirby, who instituted the sub-genus in the Linnean Transactions, erroneously characterised it by saying that the maxillæ are membranaceous. But it is truly, nevertheless, a natural groupe, and differs from the North American sub-genus *Cremastocheilus*, with which Gory and Percheron confound it, not only in having the mentum not hollowed out, but also in having the maxilla composed of two sharp round claws, the larger one being exterior, and answering to the terminal process in the *Cetoniidae* generally. The truth is, that these French critics know nothing of Mr. Kirby's groupe *Genuchus*, except that in Dejean's Catalogue, apparently their only work of reference, the *Cetonia cruenta* of Olivier, is assigned to " *Genucus* of Macleay." I am unacquainted with the cause of this, and of a myriad of smaller errors mixed up with my name in Dejean's Catalogue; but MM. Gory and Percheron copy the mistake even to the cacography of " *Genucus* ;" and thus appear, when writing a monograph on the *Cetoniidae*, to have never consulted any of Mr. Kirby's writings on the subject, although some of them are printed in so well known a publication as the Transactions of the Linnean Society. But to proceed. The sub-genus *Genuchus* is, so far as I know, entirely African, and Afzelius says that the species are always found on the ground like *Aphodii*. Dr. Smith has brought two species to Europe.

Sp. 7. (*Cryptodinus*) *Genuchus cruentus*, Oliv.

*Cremastocheilus cruentus*, G. P. p. 115. tab. 16. fig. 3.

Sp. 8. (*Cryptodinus*) *Genuchus sanguinolentus*, n. sp.

DESCR. *Genuchus* glaber, ater elytris striato-punctatis externè subsulcatis ad suturam utrinque bistratiatis maculis duabus oblongis et apice subsanguineis, ano bimaculato maculis rufis.

LONG. 5 lines.

30. *Cremastocheilus capensis*, of Klug, and several other African species, particularly from Senegal, belong to the sub-genus *Genuchus*, of which there are several sections known. I am not acquainted with the *C. Brahma* of Gory and Percheron, but I know their *Cremastocheilus maculatus*, which I suspect will be found eventually to enter the genus *Macrominus*. Their bad figure and description of this last-mentioned species, make it come far too close to the *Cetonia maculata* of Fabricius, which insect, by the way, is not a native of the Cape, as they say, but of the Mauritius.

*Sub-genus 4. CYMOPHORUS*, Kirby.

31. I have never seen any species of this groupe which is the genus *Cymophorus* of Mr. Kirby. It is the only sub-genus of *Cetoniidae* which I do not possess. Judging, however, from Mr. Kirby's description and figure of the *Cymophorus undatus*, the insect appears to come into this place. We may, perhaps, associate with it the *Cremastocheilus spiniventer* of Gory, in which case it would appear to be an African form of the genus *Cryptodinus*. I suspect it, nevertheless, to be an Asiatic sub-genus, and that *C. Brahma*, of Gory, belongs to it, forming, perhaps, another section.

*Sub-genus 5. CRYPTODUS, M'L.*

32. When my description of a New Holland insect of considerable size, which I called *Cryptodus paradoxus*, was published in 1819, I had never seen any species of the genus *Cryptodinus*, and I was even ignorant that any insect belonging to the family *Cetoniidæ* could possess corneous mandibles and maxillæ like the insects I shall hereafter describe under the names of *Macroma* and *Oplostomus*, or could have a semicircular clypeus like that of *Cymophorus*. The consequence was, that when a beetle was presented to me with antennæ of nine joints, like those of *Mæchidius*, which it also resembled in general form, and when, in addition, it offered to my notice sharp arched horny mandibles, and maxillæ terminated by sharp horny hooks, I assigned it to the family of *Trogidæ*, merely stating my doubts and difficulties, while I gave it the name of *Cryptodus paradoxus*. Since that period, I have become acquainted with many *Cryptodini*, and have found their habits to be analogous to those of the *Trogidæ*, which they represent in the family of *Cetoniidæ*. It is now long since that, by reflecting on the concealed labrum of *Cryptodus*, the dilated triangular scape of its antennæ, the horny mandibles and maxillæ, similar in form to those of *Macroma* and *Oplostomus*, the large mentum closing up the mouth, and concealing the palpi, with its naked podex so different from that of the *Trogidæ*, its depressed body, and peculiar structure, I became convinced that I ought to have assigned this most curious insect to the family of *Cetoniidæ*, and that it ought to have been placed in the immediate vicinity of *Cremastocheilus*. Still, however, the insect well merits the title of *paradoxus*, since it is as unlike *Cetonia aurata*, or any of the usual types of the family, as well may be; and besides, is the only known insect among the *Cetoniidæ* that has not ten joints to the antennæ. In short, this species serves to demonstrate the difficulty of discovering rigid characters for any family; and ere we have finished with the *Cetoniidæ*, we shall find almost every character of this group to give way except, perhaps, the concealed labrum. Yet no group of *Coleoptera* seems better marked out by nature.

33. Without having any thing very remarkable in its external facies, *Cryptodus*, perhaps, is the most singular sub-genus of all the *Petalocera* in an entomological point of view. It differs from the generality of its family, almost as much as *Hexodon* does from the *Rutelidæ*. Its flat depressed body, its broad mentum, and black colour, seem all to indicate that its place in the genus *Cryptodinus* is exactly analogous to that which the sub-genus *Platygenia* holds in the genus *Trichinus*. I am well pleased now to have an opportunity of correcting my original mistake as to the affinities of *Cryptodus*, since the correction will tend to enlarge the characters I have given to the *Cetoniidæ*, and to restrict those of the family of *Trogidæ*. It is satisfactory also to find after so many years, that this is almost the only error of consequence in my collocation of the new forms described in the first part of the *Horæ Entomologicae*, and that even this error was suspected at the time of its publication. I possess two species of the genus *Cryptodus*, both from New Holland.

34. But we shall now return to the sub-genus *Genuchus*, which alone of all the sub-genera of *Cryptodinus* indicates a tendency to have the epimeron prominently intervening between the thorax and shoulders of the elytra, and so we proceed to the next genus *Macrominus*.

*Genus III. MACROMINUS, Mihi.*

35. This group differs from the last genus *Cryptodinus*, in having the epimeron distinct

between the angles of the prothorax and elytra; it also differs in having the scape of the antennæ reduced to a more ordinary size, and in having the maxillæ often furnished with hair, among which occur those horny teeth which always arm the terminal process of these organs of the mouth, and thus form the distinguishing character of the genus, which however approaches near to the genus *Cetoniinus*, by the affinity of transmutation.

### Sub-genera.

A.—Mentum not emarginate.	$\left\{ \begin{array}{l} 1 \text{ OPISTHOMUS, M'L.} \\ 2 \text{ ANOPLOCHEILUS, M'L.} \\ 3 \text{ DIPLOGNATHA, G. P.} \end{array} \right.$	Mentum having a process on its under side. Mentum narrow with its under side simple. Mentum broad with its under side simple.
B.—Mentum deeply emarginate.	$\left\{ \begin{array}{l} 4 \text{ GNATHOCERA, K.} \\ 5 \text{ MACROMA, K.} \end{array} \right.$	Outer side of terminal process of maxillæ clothed with a brush of hairs. Outer side of terminal process of maxillæ with no brush.

NOTE. The plantulæ and pseudonychia are distinct in all these sub-genera except in *Macroma*, where they are evanescent. I have given Gory the credit of the sub-genus *Diplognatha*, although he has included insects in it which do not belong to the group.

#### Sub-genus 1. OPISTHOMUS, M'L.

36. This sub-genus retains many of the characteristics of *Cryptodinus*, particularly in the antennæ, mentum, maxillæ, &c. as will be seen from the following description, viz.

*Antennæ* of ten joints, with the scape sub-triangular depressed above, and as long as the next six joints taken together, or as the ovate clava, which consists of three joints.

*Mandibles* corneous, with a blunted point, having the membranaceous part small.

*Maxillæ* corneous, prismatic, hirsute at the back, with the terminal process composed of a long sharp hooked tooth, and the inner process armed at the point with a smaller sharp tooth.

*Maxillary palpi* shorter than maxillæ, with the last joint twice as long as the rest taken together, and having the first joints evanescent.

*Labial palpi* remarkably short, with the two first joints evanescent.

*Mentum* sub-quadrata, forming a transverse triangular prism; in front it is truncated with the sides rounded off; in the middle is the transverse ridge, forming a prominent obtuse angle; at the sides there is a tooth, that projecting forms a sinus for the labial palpus, which appears at first sight to have only one joint.

*Head* small, with quadrate clypeus. *Prothorax* trapezoidal, emarginate behind. *Scutellum* large, triangular. *Epimeron* distinct between prothorax and elytra. *Elytra* with shoulders slightly lobate. *Body* depressed like *Cetonia morio*. *Mesosternum* narrow, blunt, not advanced between the legs. *Feet* short, with the anterior tibiæ externally bidentate.

37. Olivier has described an insect from Senegal, under the name of *Cetonia fuliginea*, which MM. Gory and Percheron, have, with some reason, assigned to their genus *Cremastocheilus*. It may however be easily separated from that group by the circumstance of the epimeron being prominently distinct between the prothorax and the shoulders of the elytra. I believe the following insect brought from the Cape by Dr. Smith, to be identical with the Senegal species. At least I can observe no very important difference between the description of Olivier's insect

and that of the present Cape species. The whole insect is black, except the nine last joints of the antennæ, which are fulvous. M. Gory only states that the three joints of the clava are fulvous in the Senegal species; but, perhaps, this is a mere omission, and therefore I shall register our Cape insect as follows.

SP. 9. (Macrominus) *Oplostomus fuligineus*, Oliv.

*Cremastocheilus fuligineus*, G. P. p. 110. tab. 15. fig. 1.

38. We have to pass on now to the following sub-genus.

*Sub-genus 2. ANOPLOCHEILUS, M'L.*

*Antennæ* of ten joints, the first obconic, and the second globose.

*Mandibles* having their corneous external process very little longer than the membranaceous part.

*Maxillæ* horny, prismatic, and long, having the terminal process not distinct from the inner.

*Mentum* narrow convex, with the anterior edge semicircular.

*Head* small, subquadrate. *Body* convex and thick. *Epimeron* very visible between thorax and elytra. *Scutellum* large, triangular. *Mesosternum* blunt, and not produced. *Feet* short and strong, with the fore tibiæ tridentate, and the posterior femora sometimes incrassated, as are also the posterior tibiæ, which are always externally subbidentate.

This sub-genus has a prismatic maxilla, something like that of *Genuchus*; only terminating in three equal horny teeth. *Genuchus* has only two teeth to its maxillæ. But both subgenera agree with *Oplostomus* in the outer side of the terminal process of their maxillæ, having no brush of hair.

SP. 10. (Macrominus) *Anoplocheilus spinitarsis*, n. s.

DESCR. *Anoplocheilus nigronitidus punctatus*, clypeo minuto emarginato lateribus rotundatis, suturâ prominente, vertice pilis flavis hirsuto, thorace sub-semicirculari posticè sinuato, elytris striato-punctatis, corpore subtus pilis hirsuto, femoribus posticis valde incrassatis, articulo primo tarsi medii et postici extùs in spinam longam triangularem producto, pseudonychiis distinctis.

LONG.  $5\frac{1}{2}$  lines.

39. I do not know whether I am altogether accurate in placing the following Cape insects with indistinct pseudonychia in this sub-genus, because I have not dissected them; but they appear to agree in several respects, and possibly only differ as belonging to another section of the sub-genus. In external appearance they are all three very much alike.

SP. 11. (Macrominus) *Anoplocheilus setosus*, n. s.

DESCR. *Anoplocheilus fuliginosus* capite quadrato clypeo antice reflexo, elytris supra foveolis semi-circularibus setigeris impressis, corpore subtus pilis aureis raris vestito.

LONG.  $5\frac{1}{2}$  lines.

NOTE. This species like the following, differs from *Anoplocheilus spinitarsis*, in having no spines on the first joint of the posterior tarsi.

SP. 12. (Macrominus) *Anoplocheilus tomentosus*.

*Cetonia tomentosa*, G. P. p. 226. tab. 51. fig. 5?

NOTE. The description and figure of Gory and Percheron answer so well to my insect, that I am unwilling to believe it to be a distinct species, although they say that the *Cetonia tomentosa* of Klug is a Mexican insect. By the way, with their usual accuracy, these gentlemen have another "*Cetonia tomentosa*" from Mexico, which is probably a true *Cetonia*. I shall merely now repeat that as the clypeus of

*Anoplocheilus tomentosus* is sub-emarginate, the species appears to belong to a different section of the sub-genus when compared with *Anoplocheilus spinitarsis*. If on dissection of the mouth they should agree with the genus *Cetonia*, these two species *A. setosus* and *A. tomentosus* will evidently enter into the last Trichoid section of the sub-genus *Cetonia*.

*Sub-genus 3. DIPLOGNATHA, G. P.*

40. This sub-genus of M. Gory agrees with *Anoplocheilus* in having the end of the maxilla armed with sharp teeth. Indeed this is the character of the whole genus *Macrominus*; but the terminal process is in *Diplognatha* distinct from the base of the maxilla, and is furnished on the outside with a brush, as in the genera *Trichinus*, *Cetoninus*, and *Gymnetinus*. The mentum also is broad, truncated, scarcely emarginate in front, and having the corners rounded off. But for the rest I refer to MM. Gory and Percheron's description of this groupe, which appears to admit of the following sections. As all the sections, however, are not yet known, it is difficult to place them accurately; and I give the following arrangement only provisionally :—

*SECTIONS OF DIPLOGNATHA.*

Maxillæ having one tooth on the inner process.	1 CARBONARIAE.	{ Terminal process of maxillæ ending in a blunt tooth. Inhabit Asia.
	2 PORPHYREA.	
	3 GAGATESIAE.	
		{ Terminal process of maxillæ ending in a sharp tooth. Inhabit Africa.
		{ Terminal process of maxillæ ending in two sharp teeth. Inhabit Africa.

41. The first of these sections is numerous in species. The type of it may be considered to be *Cetonia crucigera* of Olivier. *Cremastocheilus maculatus* of Gory appears to form another section. The general colour of the first section is black, often variegated with white spots.

42. To the second of these sections appears to belong the common Cape insect, *Scarabæus carnifex* of Linnæus.

Sp. 13. (*Macrominus*) *Diplognatha carnifex*, Fab.

*Cetonia Carnifex*, Fab. Syst. Eleuth., 2. 143. 39.

*Diplognatha Carnifex*, G. P. p. 124. tab. 18. fig. 2.

43. The two following Cape species belong to the third section :—

Sp. 14. (*Macrominus*) *Diplognatha hebræa*, Oliv.

*Cetonia hebræa*, Oliv. tab. 12. p. 115.

*Diplognatha hebræa*, G. P. p. 125. tab. 18. fig. 3.

Sp. 15. (*Macrominus*) *Diplognatha silicea*, n. s.

DESC. *Diplognatha* atronitida glabra polita, clypeo vix punctato palpis labialibus haud ultra mentum prominulis, elytris anticè latioribus, tibiis anticis extus vix tridentatis, mesosterno subacuto.

LONG. Corp. 15 lines.

NOTE. MM. Gory and Percheron seem to have confounded this last species with the true *Cetonia Gagates* of Olivier, which is a Senegal insect, and smaller, having the labial palpi stretching beyond the mentum, the sides of the elytra parallel, the anterior tibiae tridentate, and the mesosternum rather obtuse. I have found *Diplognatha Gagates* common at Porto Praya in the Cape de Verds; but I cannot say that it is a flower-frequenting insect, as I never met with it except in the Cocoa-nut groves below the town, and

always on the foliage of the underwood which grows beneath the Palms. The whole section of *Diplognathæ Gagatesiaæ* is remarkable for having a thorax lobed behind like that of the genus *Gymnetinus*.

*Sub-genus 4. GNATHOCERA*, Kirby.

44. This is the genus *Gnathocera* of Kirby, as published in the Linnean Transactions; but it is not the genus *Gnathocera* of Gory. By the last entomologist our present groupe is called *Amphistoros*, and although he has adopted the very same type for it as Mr. Kirby, namely, the *Cetonia elata* of Fabricius, he has given Kirby's name *Gnathocera* to another groupe! This confusion has arisen from indolence, or rather from the usual unwillingness of the French to consult original authorities. Mr. Kirby, not aware that the type of his new genus had been described by Fabricius, called it *Gnathocera vitticollis*. But instead of reading Mr. Kirby's well-known papers, M. Gory appears to have merely consulted the catalogue of M. Dejean, a work too full of this kind of error. The name *Amphistoros*, therefore, can never be applied, unless perhaps to some hereafter-to-be-discovered section of this sub-genus; and the groupe called "*Gnathocera*" by Gory requires another name. I shall, however, save naturalists the trouble of inventing a new one, by adopting for Gory's groupe the name of *Coruphes* or *Coryphe*, which, according to what is stated in his introduction, he originally intended to give to it.

45. The sub-genus *Gnathocera* is tolerably well marked out by Kirby, but by M. Gory the parts of the mouth are badly described, and erroneously figured. The outer and inner lobe of the maxilla are both furnished with about three or four small teeth in each. This curious form of maxillæ, the dentated clypeus, the advanced mesosternum, and emarginate mentum, all serve to separate *Gnathocera* from *Diplognatha*. As yet we only know one section of it, which is from Intratropical Africa.

*Sub-genus 5. MACROMA*, G. P.

46. This is one of the most singular sub-genera of the *Cetoniidæ* yet known, so far as the organs of the mouth are concerned; but it shews that M. Gory neither understood the true character of the family, nor had fully investigated the structure of the sub-genera, when he distinguished the *Cetoniidæ* from the rest of *Petalocera*, by their having the mandibles "rudimentary or even absent." Here is a sub-genus, called "*Macroma*" by Gory, which has mandibles and maxillæ as strong, hard, and corneous as any melolonthidous insect. Still they are but modifications of the usual manducatory organs of the *Cetoniidæ*. The maxillæ and mentum are more accurately figured than usual by Gory; of the mandibles he says nothing. These are shaped like those of *Mæchidius*, only sharper; the membranaceous subquadrate part being evanescent. The maxillæ have two strong teeth at the apex of the inner lobe, and one strong sharp curved one holding the place of the terminal process. I understand this maxilla to be that of *Gnathocera*, only modified in as far as that the several teeth in each lobe of the latter sub-genus are here confluent, so as to form a maxilla which has nothing resembling it among *Petalocerous Coleoptera*, unless it be that of *Oplostomus*, *Cryptodus*, or *Cremastocheilus*. There is no pencil of hair on the outside of the terminal process. If *Macroma javanica* and *M. bicolor* of Gory belong to this sub-genus, as I believe they do, then they will probably form distinct sections of it. The type of the sub-genera has hitherto been brought from Senegal; but Dr. Smith having gone north within the tropics, has brought it also from the extreme point of his journey. This is the more curious, as he was on the east coast, so

that it appears to be an insect having a very wide range. But the truth is, that Dr. Smith has brought many species which I find to be identical with those of Senegal, and some with those even of Upper Egypt.

Sp. 16. (*Macrominus*) *Macroma scutellata*, *Fab.*

*Macroma scutellaris*, G. P. p. 148. tab. 23. fig. 4.

47. M. Gory assigns the name *Macroma* to Mr. Kirby. I am not aware of the work in which Mr. Kirby has published it, but, at all events, this would not seem to have been the name given by him to *Macroma scutellata*. If Mr. Hope be correct, the true *Macroma* of Mr. Kirby is probably one of the sections of the sub-genus *Schizorhina*. Gory, in his "errata," says, with a ludicrous desire to be profoundly accurate, "Aux genres *Macroma* et *Schyzorhina* de Kirby il y eu par mégarde une transposition de noms; ainsi nos *Macroma* sont les *Schyzorhina* de Kirby, et les *Schyzorhina* de Kirby sont nos *Macromes*!" Now, this is rather unfortunately asserted, since, as *S. 4-punctata* is the first species of the genus "*Schyzorhina*" mentioned by Gory, and *S. atropunctata* is Mr. Kirby's type of his genus *Schizorhina*, (called *Schyzorhina* in Dejean's catalogue,) and since these two species are so close as to be scarcely more than varieties, why it is very clear that the *Macroma scutellaris* of Gory is not a *Schizorhina* of Kirby, but that the *Schizorhina* of Kirby is the very same groupe as that mis-called *Schyzorhina* by M. Dejean and his copier Gory. Whether Mr. Kirby be really acquainted with the singular sub-genus *Macroma*, I know not; for Gory, when he attributes the institution of his "genus *Macroma*" to our venerable countryman, evidently follows his usual, sole, and sovereign authority, Dejean's Catalogue. I shall only say, that whoever first named this sub-genera, pointed out a most natural and curious groupe.

48. We shall now return to the sub-genus *Diplognatha*, which has a quadrate clypeus and a thorax that commences to be lobate behind. It has also the terminal process of the maxilla clothed behind with a brush of hair, and armed with curved corneous teeth at the apex, while one of its sections has an irregular clypeus. But all these characters belong to *Philistina*, which is a sub-genus of my *Gymnetinus*.

#### Genus IV. GYMNETINUS, K.

This is a groupe which is distinguished by the middle of the thorax being produced behind into a lobe that conceals the scutellum in a greater or less degree, sometimes even entirely. It is a genus which has the mentum always emarginate, and, like *Macrominus*, is entirely extra-European. None of the species, however, are found on the African Continent.\* This genus answers to the family *Gymnetidæ* of Kirby, and *Gymnetides* of MM. Gory and Percheron; but it is not easy to discover the rules which these gentlemen have followed in distinguishing families from genera, or whether indeed they have had any rule at all, as they rarely deign to characterize their groups. All the sub-genera which I shall now proceed to detail have the pseudonychia very distinct, except *Agestrata* and *Lomaptera*, where they appear in some degree to be evanescent. I need scarcely say that I have not ascertained the proper character by which to separate the normal from the aberrant groupe.

\* I see no good reason for believing that the *Cetonia strigosa* of Fabricius is a native of the Cape of Good Hope.

## Sub-genera.

B.—Sides of the elytra in general parallel.	1 PHILISTINA, M'L.	Maxillæ armed with corneous teeth. Scutellum distinct. ♂ Clypeus porrect and bifid at apex. ♀ Clypeus quadrate, entire. India.
	2 AGESTRATA, Esch.	Maxillæ armed with one corneous tooth. Scutellum visible. Clypeus quadrate and entire. India.
	3 LOMAPTERA, G. P.	Maxillæ armed with no corneous tooth. Scutellum evanescent. Clypeus deeply cleft. India.
A.—Sides of the elytra rarely parallel.	4 GYMNETIS, M'L.	Posterior margin of thorax as wide as elytra. Scutellum evanescent. America and India.
	5 MACRONOTA, Wied.	Posterior margin of the thorax narrower than the elytra. Scutellum distinct. India and Madagascar.

49. In the *Zoologisches Magazin*, Band 2, Stück 1, published in 1823, M. Wiedemann described a Javanese insect under the name of *Goliathus rhinophyllus*. As such the insect appears in Dejean's Catalogue; and I confess that when I first saw the species many years ago in the collection of M. Bosc, at Paris, I also considered it to belong to the sub-genus *Goliathus*. In the monograph of MM. Gory and Percheron, however, the insect is called "Macronata rhynophylla," and Wiedemann is erroneously cited as the authority for this double barbarism. These French naturalists are so far right in assigning our insect to the sub-genus *Macronota* of Wiedemann, that it certainly comes much nearer to this group than to *Goliathus*. M. Latreille seems, nevertheless, to have been the first who observed that it was not a *Goliathus*. From this sub-genus it differs in the long corneous part of the mandibles, in the maxillæ being armed with corneous teeth, in the mentum being very slightly emarginate, and in various other particulars, so important as to prove to us that the obvious relation which this Javanese insect bears to *Goliathus* is nothing more than one of analogy; and on account of this analogy I have assigned the species to the

## Sub-genus 1. PHILISTINA, M'L.

*Antennæ* of ten joints, the scape being long and obconical, the second joint globose, larger than the remainder, the three joints excepted that compose the long pear-shaped clava.

*Labrum* membranaceous, emarginate.

*Mandibles* having the corneous part sharp, lanceolate, and twice as long as the square membranaceous part.

*Maxillæ* short, prismatic, and terminating in three, if not more, sharp corneous teeth, which are covered behind with a long pencil of hairs.

*Maxillary palpi* differing in the sexes.

*Labial palpi* differing in the sexes.

*Mentum* quadrate, truncated in front, and very little emarginate.

*Clypeus* produced into a long horn in male, and quadrate in female. *Body* depressed.

*Thorax* much narrower than elytra, and not very much lobed in the middle behind; in the male it is horned. *Scutellum* large, triangular. *Epimeron* transversely distinct.

*Mesosternum* not produced. *Anterior tibiae* in both sexes externally tridentate, and with very long tarsi in the male. *Feet* with plantula and pseudonychia very distinct.

NOTE. As there is only one species known which is the "Macronata rhynophylla" of Gory, it is very

probable that the above description is rather the character of a section than that of the sub-genus to which this section belongs. I believe that this sub-genus contains many forms, all resembling *Goliathus*. Mr. Hope, for instance, indicates, as a section, a genus called *Jumnos* which may possibly come here. But I know it not.

*Sub-genus 2. AGESTRATA*, Eschscholtz.

50. This groupe agrees with *Philistina*, inasmuch as the maxilla is armed with a corneous tooth, which is covered with a long pencil of hairs, while the clypeus is quadrate and formed like that of the female of the foregoing sub-genus. But here the mentum is deeply emarginate, the mesosternum is advanced, the scutellum is minute, and the sexes differ in only one of them having the anterior tibiæ externally tridentate. The type is the common *Agestrata chinensis*, and there is no other section as yet known, although Mr. Hope says that he is acquainted with ten species.

*Sub-genus 3. LOMAPTERA*, G. P.

51. This sub-genus differs from *Agestrata* in having the clypeus and mentum deeply cleft, while the maxilla terminates in a mere pencil of hairs, the mesosternum is produced into a spine, and the scutellum disappears under the enormous sharp-pointed lobe of the thorax. In neither this nor the preceding sub-genus are the pseudonychia very distinct. *Lomaptera* is a groupe composed of beautiful insects, which appear to have their metropolis in Timor and New Guinea. A good type is the splendid *Lomaptera bivittata* of MM. Quoy and Gaimard. But the truth is, that only one of the sections is known.

*Sub-genus 4. GYMNETIS*, M'L.

52. This sub-genus has the clypeus entire, and the quadrate mentum simply emarginate at the front. Here, moreover, the scutellum altogether disappears under the great lobe of the thorax. Only two American sections have as yet been characterised, viz. 1. SUB-CORNUTÆ, of which the type is *Gymnetis nitida* (Horæ Entomologicæ, p. 153,) which may be characterized by their sub-cornute clypeus, and very minute scutellum; and 2. MARMORINÆ, K., of which the type is *Gymnetis marmorea*, (Zool. Journal, vol. 3. p. 153,) and which may be distinguished by their simple clypeus, and their having no visible scutellum. But there are other sections known, one at least of which is Asiatic.

*Sub-genus 5. MACRONOTA*, Wiedemann.

53. MM. Gory and Percheron exhibit their acquaintance with the signification of this name by always terming it "Macronata." The sub-genus comes very close to *Philistina*. As in it, the elytra are here much wider than the thorax, which is not deeply lobed, and the scutellum is conspicuous, while the mesosternum is not far advanced. But, on the other hand, the deeply emarginate mentum, and the maxilla without corneous teeth, serve to separate it from *Philistina*, and to join it to *Gymnetis*. *Macronota* is an extensive groupe, offering sections and sub-sections. I am not aware, however, that any have been hitherto separated except the genus *Dorysceles* of Dejean, which is merely a section of the sub-genus *Macronota*, and of which the type is *Macronota calcarata* of Klug, which is a native of Madagascar. This section is to be known from the rest of the sub-genus *Macronota* by the clypeus being narrower at the apex, and by the mentum not being so deeply emarginate. The male of the only known species has two long spines inserted in the extremity of the posterior tibia, and articulating

with it, of which the inner one is curved, falciform, exceedingly acute, and nearly as long as the whole tarsus.

54. As none of the above five sub-genera are found at the Cape—nor indeed in Africa—I have no occasion to say more of them, than that all, except *Philistina* and *Agestrata*, have the external process of the maxillæ membranaceous. Yet I have never seen the American species of *Gymnetis* on flowers, but invariably have found them by beating the leaves of trees, out of which they fall on the ground, as if dead, not moving a limb. I suspect that the other sub-genera, from their superior brilliancy of colour, are more fond of flowers than *Gymnetis*.

55. From *Lomaptera*, the metropolis of which is New Guinea, and which has its clypeus deeply bifid, we pass possibly by one of the sections unknown, to the New Holland groupe *Schizorhina*, which also has the clypeus forked. But *Schizorhina* is a sub-genus of the

#### *Genus V. CETONINUS*, Mihi.

The thorax of *Cetonus* is never lobed behind, but rather emarginate. The mandibles are membranaceous, and the maxillæ scarcely ever armed with corneous teeth, but merely furnished with a pencil of hairs. The females always have the anterior tibiæ externally dentated; and both sexes almost always have the epimeron prominent between the angles of thorax and elytra. The species of this genus are found in all quarters of the globe, but particularly in Africa. In America they are comparatively rare, the sub-genus *Gymnetis* of the preceding genus *Gymnetinus* assuming their place there in the economy of nature. The following are the

#### Sub-genera.

B.—Males having the anterior tibiæ without teeth, except where the insects are extremely close to the normal groupe.	<table border="0"> <tr> <td>1 SCHIZORHINA, K.</td><td>Clypeus emarginate in both sexes. Mentum somewhat emarginate.</td></tr> <tr> <td>2 CORYPHE, G. P.</td><td>Clypeus not emarginate. Mentum not emarginate.</td></tr> <tr> <td>3 GOLIATHUS, Lam.</td><td>Clypeus of males horned. Mentum deeply emarginate.</td></tr> </table>	1 SCHIZORHINA, K.	Clypeus emarginate in both sexes. Mentum somewhat emarginate.	2 CORYPHE, G. P.	Clypeus not emarginate. Mentum not emarginate.	3 GOLIATHUS, Lam.	Clypeus of males horned. Mentum deeply emarginate.
1 SCHIZORHINA, K.	Clypeus emarginate in both sexes. Mentum somewhat emarginate.						
2 CORYPHE, G. P.	Clypeus not emarginate. Mentum not emarginate.						
3 GOLIATHUS, Lam.	Clypeus of males horned. Mentum deeply emarginate.						
A.—Males having the anterior tibiæ externally dentated.	<table border="0"> <tr> <td>4 ISCHNOSTOMA, G. P.</td><td>Mentum not sub-quadratus, but generally convex in front.</td></tr> <tr> <td>5 CETONIA, G. P.</td><td>Mentum sub-quadratus, and almost emarginate in front.</td></tr> </table>	4 ISCHNOSTOMA, G. P.	Mentum not sub-quadratus, but generally convex in front.	5 CETONIA, G. P.	Mentum sub-quadratus, and almost emarginate in front.		
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5 CETONIA, G. P.	Mentum sub-quadratus, and almost emarginate in front.						

56. They who study natural history philosophically, must have observed with Fries how strongly marked are those analogies which exist between the corresponding points of the two parallel divisions of a normal groupe. Here the genera *Cetonus* and *Gymnetinus* form the normal groupe of the family of *Cetoniidæ*, and the analogies between their sub-genera are as follow:—

1 LOMAPTERA.	Clypeus cleft in both sexes.	1 SCHIZORHINA.
2 AGESTRATA.	Males with unarmed anterior tibiæ.	2 CORYPHE.
3 PHILISTINA.	Males with a horned clypeus.	3 GOLIATHUS.
4 MACRONOTA.	Thorax narrower than elytra; feet long.	4 ISCHNOSTOMA.
5 GYMNETIS.	Body depressed; feet short.	5 CETONIA.

Again the Sub-genera of *Cetonus* represents the five Généra of the Family, thus :

SCHIZORHINA	by its cleft clypeus represents <i>Lomaptera</i> of	GYMNETINUS.
CORYPHE	is a part of and the very perfection of	CETONINUS.
GOLIATHUS	by the epimeron of the <i>Incae</i> represents	TRICHINUS.
ISCHNOSTOMA	by the convex mentum of the <i>Calocephalæ</i>	CRYPTODINUS.
CETONIA	in exterior form agrees peculiarly with	MACROMINUS.

NOTE. Thus we learn that although *Cetonia* be a normal sub-genus of *Cetonus*, it does not repre-

sent it in the genus. In fact, no insects of this genus have such a peculiarly cetonine aspect, if I may use the expression, as the brilliant species of *Coryphe*. But I proceed to the discussion of the sub-genera.

*Sub-genus 1. SCHIZORHINA*, Kirby.

57. This is remarkably like *Lomaptera*, for the clypeus in both sexes is more or less cleft. The mesosternum, in like manner, is often prominent and acute. The females have the anterior tibiae externally tridentate, but the males have them without teeth. The maxillæ are long, with the terminal lobe also long and villose. The mentum is more or less emarginate; and the groupe is almost peculiar to New Holland and the adjacent islands. The species called *Schizorhina Brownii* by Kirby is evidently the nearest to *Lomaptera*, as it presents vestiges of the lobate thorax. There are five sections known, for which the following names may serve in want of better:—

*SECTIONS OF SCHIZORHINA.*

A.—Elytra broader at their base.	1 BRUNONIÆ, M'L. 2 PHILLIPSÆ, M'L.	Mesosternum produced, narrow, flat. Elytra spinose at apex. Type, <i>S. Brownii</i> , K.
	3 INTEGRÆ, M'L.	Mesosternum broad, flat, lanciform. Elytra with subsinuated sides and spinose at apex. Type, <i>S. Phillipsii</i> , Schreibers.
	4 GYMNOPLEURÆ, M'L.	Mesosternum short, flat. Clypeus rather entire. Elytra with sinuated sides and no spines at apex. Type, <i>S. frontalis</i> , Don.
B.—Elytra not broader at base.	5 INSULARES, M'L.	Mesosternum produced, flat. Clypeus emarginate. Elytra with sinuated sides and no spines at apex. Type, <i>S. punctata</i> , Don.
		Mesosternum produced, narrow, cylindrical. Clypeus emarginate. Elytra spinous at apex, and with parallel sides. Type, <i>S. cyanea</i> , Oliv.

NOTE. As none of the above sections occur in Africa, I shall say little of them, except that Gory erroneously confounds the *Cetonia carinata* of Donovan with the *C. Phillipsii* of Schreibers. Being in possession of the identical specimens described by the latter naturalist in the Linnean Transactions, I have the means of judging; but I must confess that the two species come very near to each other.

The last section, which I have called *INSULARES* because they are in general natives of Madagascar or of the islands adjacent to New Holland, has a narrow advanced mesosternum—elytra with parallel sides, and which are spinose at apex. The inner process of the maxilla in these insects has no tooth, and their mentum is deeply emarginate. All these circumstances, and others, such as their peculiar colours, and the females having the anterior tibiae externally tridentate, show us how we may pass to the next sub-genus, which however will be found to have the clypeus never cloven.

*Sub-genus 2. CORYPHE*, G. P.

58. This, as I have already stated, is called the genus *Gnathocera* of Kirby, in the monograph of Gory and Percheron. Now, as I have shown this to be an error borrowed from Dejean's Catalogue, and as the present groupe is an excellent one, which had previously been named "Coruphes" by M. Gory, on account, as he says, of its carinated vertex, I think no one will object to his first nomenclature, unless perhaps they may think it necessary to correct his

spelling, which certainly ought to be *Coryphe* or *Coryphæa*. I prefer the former word, as it appears to be what M. Gory was aiming at; and, besides, means a lady's ornament, for which purpose, in fact, some of the brilliant species of this sub-genus serve in the Philippine islands.\* It is true that Dr. Leach gave this name "*Corypha*" to a groupe of *Staphylinidæ*; but it has never been adopted, so far as I know; and Gory has certainly the right to name a groupe of which he first pointed out very nearly the true limits. It is distinguished from *Schizorhina* by the porrected mesosternum diverging from the prothorax, by its often carinated vertex, and clypeus always entire in front. From the sub-genus *Goliathus*, to which it is exceedingly close, this sub-genus may be known by the maxillæ having the terminal process shorter and in a line with the base, and by the mentum being more truncated, but, above all, by the horny part of the mandibles being much longer than the square membranaceous part. The males scarcely ever have any teeth on the external side of their anterior tibiæ, and when they possess such teeth it is merely because they belong to aberrant species.

#### SECTIONS OF CORYPHE.

B.—Mentum emarginate. ♀ with anterior tibia externally bidentate, rarely tridentate.	1 NARICIAE, Dup.	Maxilla having the inner process generally unidentate. Thorax not semicircular. ♂ Clypeus sometimes horned or bifurcate. India. Type, <i>Cetonia MacLeaii</i> , K.
	2 DICEROS, G. P.	Maxilla having the inner process unidentate. Thorax semicircular. ♂ clypeus bifurcate. Indian Islands. Type, <i>C. bicornis</i> , Lat.
Asiatic Insects.	3 RHOMBORHINAE, H.	Maxilla having no tooth on the inner process. Thorax not semicircular. ♂ with clypeus generally horned. Asia. Type, <i>C. Hardwickii</i> , G. P.
A.—Mentum not emarginate.	4 SCHÜPPELLIAE, M'L.	Maxilla with no tooth on the inner process. ♀ anterior tibiæ externally tridentate. Southern Africa. Type, <i>C. suturalis</i> , Fab.
African Insects.	5 CHLOROCALAE, K.	Maxilla with its inner process unidentate. ♀ anterior tibiæ without teeth. Tropical Africa. Type, <i>C. Iris</i> , Fab.

I have named one of these sections after a prominent species. Mr. Kirby indicated another under the name of *Chlorocala*, as did Mr. Hope another under the term *Rhomborhina*. The second section in the above list is what MM. Gory and Percheron term their genus "*Dicheros*." And as for the first, M. Dupont has some right to name it, since one of the insects he calls "*Narycius*" appears to belong to it.

59. With respect, then, to the section *NARYCIAE* of Dupont, I would observe, that it is remarkable for its brilliant green colouring, which is sometimes rendered still more vivid by spots of some different hue. The groupe is entirely Indian, and the *Coryphe MacLeaii* (the *Cetonia MacLeaii* of Kirby) seems to be its best type. Here I may remark, that the *Gnathocera MacLeaii* of Gory is not the *Cetonia MacLeaii* of Kirby. In the latter species the black discal spot of the thorax does not touch its hinder margin, and besides the clypeus of the male has not two parallel horns proceeding from its sides, but only one short vertical horn, something like that of the well-known insect *Coryphe flavomaculata*, Fab. The *Gnathocera MacLeaii* of Gory ought therefore to retain the trivial name it originally received from its discoverer Eschscholtz, and be henceforth called *Coryphe pretiosa*. But this species, together with the insect called *Narycius olivaceus* by Dupont, and the beautiful *Cetonia guttata* of Olivier,

\* See Linn. Trans. vol. 12. p. 409.

appear to be aberrant in the section, and to connect it with the following one called *Diceros*. The following species indeed may perhaps represent so many sub-sections:—

{ 1 Cetonia elegans, <i>Fab.</i>	Colour green. ♂ Clypeus with no horn.
{ 2 Cetonia MacLeaui, <i>K.</i>	Colour green with black spots. ♂ Clypeus with a short vertical horn.
{ 3 Cetonia pretiosa, <i>Esch.</i>	Colour green with black spots. ♂ Clypeus with two lateral horns.
{ 4 Cetonia guttata, <i>Oliv.</i>	Colour green and red with white spots. ♂ Clypeus with two lateral horns.
{ 5 Narycius olivaceus, <i>Dup.</i>	Colour green. ♂ Clypeus with two lateral horns.

60. With respect to the section *DICEROS*, it is true that MM. Gory and Percheron have made a genus of it; but except a slight difference in the form of the thorax, and the colour, we find little to distinguish the groupe from the section *Nariciae*, which I have founded on the badly characterized groupe which has been called *Narycius* by Dupont. The organs of the mouth are the same in both. However, there are as yet only two species described of the section *Diceros*; namely, the *Cetonia bicornis* of Latreille, a Timor insect, which is figured in the fourth volume of the first edition of Cuvier's *Regne Animal*, and the *Dicheros decorus* of Gory, which is a Javanese insect. The *Cetonia bicornis* of Latreille is called "bicornuta" by Gory, and, what is singular enough, is erroneously assigned by Mr. Kirby to his own genus *Gnathocera*.

61. The type of the third section *RHOMBORHINÆ* is the *Gnathocera Hardwickii* of Gory, a Nepaul insect, which is horned, and comes very near to the *Goliathus 4-maculatus* of Africa. The difference between them consists in both sexes of *Coryphe Hardwickii* having the clypeus alike, and in the female having the anterior tibiae externally bidentate. Although I am not acquainted with the insect, I suspect that the *Goliathus opalinus* of Gory, which Mr. Hope is said to have made the type of his groupe *Trigonophora*, will eventually be found to form a sub-section of *Rhomborhinæ*, where the female has a simple clypeus. And I have reason to suspect, moreover, that the insect called "*Jumnos Ruckeri*" in Mr. Hope's Coleopterist's Manual, forms still another sub-section of the *Rhomborhinæ*, which comes yet nearer to the sub-genus *Goliathus* than either of the former sub-sections, and osculates with it. All the species of this section are Asiatic.

62. The fourth section, *SCHÜPPELLIÆ*, is African, and may be easily known by the sharp prominent sternum, and by the anterior tibiae of the males being without teeth, while those of the females have externally three. This groupe will admit of sub-sections, of which the following insects appear to be types.

A.—Males without teeth on the outer side of anterior tibiae.	{ 1 Cetonia flavomaculata, <i>Fab.</i>	♂ with clypeus horned.
	{ 2 Cetonia tenuis, <i>P. B.</i>	♂ with clypeus simple. Posterior tibiae without a tooth.
	{ 3 Cetonia umbonata, <i>Klug.</i>	♂ with clypeus simple. Posterior tibiae unidentate.
B.—Males having the anterior tibiae somewhat bidentate.	{ 4 Cetonia suturalis, <i>Fab.</i>	
	{ 5 Cetonia ***	

63. Dr. Smith has brought home the type of the first of the foregoing sub-sections, viz.:—

Sp. 17. (*Cetoninus*) *Coryphe flavomaculata*, *Fab.*

*Gnathocera flavomaculata*, G. P. p. 139. tab. 21. fig. 5.

NOTE. MM. Gory and Percheron have only described the female. The male has a short horn on the vertex, and the apex of its clypeus is recurved and emarginate. The male has also its anterior tibiae without teeth. By the way, the trivial name of this common species ought to be "*bimaculata*," for no less an entomologist than Degeer originally described and figured it under this name. If this change be adopted, the *Cetonia bimacula*, Wiedem., which if it be the same as the *Gnathocera bimaculata* of Gory, appears to belong to some sub-section of *Diceros*, may then be called *Coryphe Wiedemannii*.

64. Of the second sub-section of *Schiüppelliae*, Dr. Smith has also brought home one species, which M. Gory confounded with the *Cetonia Tænia* of Palisot de Beauvois. I happen to possess both species, and find them to be quite distinct. In the true *Coryphe Tænia* the margin of the thorax is not yellow, while the body is wider than that of the new Cape species, and the colour more viridi-aeneous. I shall honour my new species with the name of the distinguished philosopher to whom Dr. Smith's expedition was so much indebted. It will also commemorate his uncle, who was a meritorious entomologist, particularly attached to the study of *Coleoptera*. I may here observe, that M. Gory has only described the male.

Sp. 18. Cetoninus) *Coryphe Herschelli*, n. s.

DESCR. *Coryphe olivaceo-aenea nitida, corpore subtus thoracisque margine rufescensibus, elytris fasciâ emarginatâ flavâ notatis, tibiis tarsisque nigris.*

*Gnathocera tænia*, G. P. p. 138. tab. 21. fig. 4.

LONG. 11 lines.

65. Of the third sub-section of *Schiüppelliae*, Dr. Smith has collected the type.

Sp. 19. (Cetoninus) *Coryphe umbonata*, Klug.

♂ *Gnathocera umbonata*, G. P. p. 141. tab. 21. fig. 4.

♀ *Cetonia propinqua*, G. P. p. 265. tab. 51. fig. 3.

NOTE. Here MM. Gory and Percheron appear to have described the male and female as different genera. The female has a simple quadrate clypeus, and the anterior tibiæ tridentate. According to M. Gory, she comes from Mexico. However this may be, Dr. Smith has brought her also from the Cape of Good Hope, from whence M. Verreaux has also brought me the male.

66. The fourth sub-section, as yet, has only been found in intratropical Africa. Its type is *Coryphe suturalis*, Fab., which resembles *C. umbonata* exceedingly in colour and markings; but the body is narrower, and this insect leads us to the *Coryphe bimacula*, Wiedem., by the affinity of transmutation.

67. I now proceed with the sections of *Coryphe*, as the fifth, which Mr. Kirby has called CHLOROCALÆ, has not yet been particularly noticed. The *Coryphe Africana*, Fab., is a very good type of this group, which is entirely African and intratropical. It comes very near to the Asiatic section "Nariciæ," and like it, is remarkable for its brilliant green colouring, only here this colouring is pure and without spots. But we must now return to the aberrant section "Rhomborhinae," as it leads us to what may be deemed the *principes Coleopterorum*.

#### Sub-genus 3. GOLIATHUS, Lamarck.

As this is perhaps the most beautiful group of *Coleoptera* known, and as one of the sections consists of the largest as well as rarest insects that can grace our cabinets, I shall give a brief view of all the species of the sub-genus which are known to me. The males have the clypeus always horned, but the thorax never; which, by the way, will distinguish *Goliathus* from *Philistina*. The maxilla has rarely any corneous teeth, and its terminal lobe, crowned with a pencil of hair, is always bent inwards at right angles to its back. The corneous lobe of the mandible is very short, and rarely longer than the square membranaceous part. The mentum is deeply emarginate or bilobed.\* The males have the anterior feet elongated, while the females have the anterior tibiæ always externally tridentate. The three species called by MM. Gory and Percheron *Goliathus heros*, *Goliathus Melly*, and *Goliathus opalinus*, appear all to belong to the last sub-genus *Coryphe*, although they undoubtedly approach very closely to that section

\* Professor Klug describes it as trilobed in the female of his *Goliathus regius*, but this is probably a mistake.

of *Goliathus*, which I shall call *Smithii*, after my friend Dr. Smith. There is another species mentioned by M. Schönnherr, and described in his appendix under the name of *Cetonia geotrupina*, which I am clearly of opinion belongs to the sub-genus *Ischnostoma*, and to the section of it called by me *Cælocephalæ*.

#### SECTIONS OF GOLIATHUS.

B.—Male having the anterior tibiae never like those of the female.	1 SMITHII, M'L. 2 HÖPFNERII, M'L. 3 GIGANTEI, M'L.	Thorax semicircular and truncated behind. Body depressed. ♂ anterior tibia internally multidentate, the teeth very minute, sometimes evanescent. Tropical Africa.
A.—Male having the anterior tibiae externally dentated like those of female.	4 INCA, Lep. & S. 5 DICRONOCEPHALI, H.	Thorax trapezoidal and truncated behind. Body depressed. ♂ anterior tibiae without any teeth. North Tropical America.
		Thorax sub-lobate behind. Body sub-convex. ♂ anterior tibiae without any teeth. Tropical Africa.
		Thorax rather circular, lobate behind. Body convex. Anterior femur with a spine on the inside at the extremity. Epimeron not prominent between the angles of the thorax and elytra. South Tropical America.
		Thorax circular. Body depressed. Anterior femur with no spine on the inside at the extremity. Epimeron prominent between the angles of thorax and elytra. Tropical Asia.

#### Section 1. SMITHII.

68. This section inhabits intratropical Africa. It may be easily known by having the elytra wider at the base, by having the body very depressed, by the thorax being nearly truncated behind, or, at least, being only slightly emarginate, to receive the scutellum. In short, this group comes very close to the general form and colouring of the sub-genus *Coryphe*, and the female indeed, not having a horned clypeus, can with difficulty be distinguished from it. The males have almost always the anterior tibiae denticulated on the inside. The *Goliathi Smithii* have a quadrate head, and admit of the following sub-sections, which I shall not name, as my object is merely to shew their structure and affinities:—

	Sub-sections.	Types.
A.—Males having the anterior tibiae externally tridentate.	1 ♂ Clypeus with a single porrected simple horn. 2 ♂ Clypeus with three horns, the middle one diverging or bifid at the apex. (MECYNORHINA, Hope.)	<i>G. torquatus</i> , Drury. <i>G. Polyphemus</i> , Fab.
B.—Males having the anterior tibiae externally without teeth.	3 ♂ Anterior tibiae internally denticulated; last joint of the anterior tarsus with a brush on the inside above the unguis. (DICRONORHINA, Hope.) 4 ♂ Anterior tibiae internally denticulated; last joint of the anterior tarsus without a brush. 5 ♂ Anterior tibiae having no teeth externally or internally.	<i>G. micans</i> , Fab. <i>G. Smithii</i> , M'L. <i>G. 4-maculatus</i> , Oliv.

SP. 20. (Cetonus) *Goliathus torquatus*, Drury.

DESCR. *Goliathus* velutino-viridis; vertice, thoracis margine antico, vittis duabus triangularibus anticis abbreviatis, elytrorum lineis duabus marginalibus interruptis maculisque octo suturalibus albescientibus, pygidio viridi maculis duabus albis, corpore infrâ viridicupreo, tarsis nigris.

♂ Capite albo, clypei cornu simplice porrecto subrecurvo apice acuto.

♀ Clypeo quadrato simplice.

*Scarabaeus torquatus*, Drury, III. p. 60. tab. 44. fig. 1.

*Cetonia collaris*, Schönnherr, Syn. Ins. 1. 3. p. 127. 36.

LONG. 32, lines.

NOTE. The original specimen was a female badly described and figured by Drury. It is now in my cabinet. Drury says that it was received from Sierra Leone. Within these few days Mr. Strachan has brought the male from that colony. It differs from all the other known males of *Goliathus* in not having the horn of the clypeus bifid. I am ignorant of the grounds upon which Schönnherr assumed the right to change Drury's unobjectionable specific name.

SP. (Cetonus) *Goliathus Polypheus*, Fab.

DESCR. *Goliathus* velutino-viridis, thorace quinque-lineato linea mediâ abbreviatâ, elytris maculis albis seriatim dispositis.

♂ Capite tricorni cornu medio porrecto apice bifido

♀ Incognita.

*Cetonia Polypheus*, Oliv. Ins. tab. 8. fig. 61.

LONG. 30 lines.

NOTE. An unique specimen of this rare and valuable insect was for many years the chief ornament of the Entomological Cabinet bequeathed by the late Sir Joseph Banks to the Linnean Society. It was the male described by Fabricius and figured by Olivier. This specimen however appears to have been stolen since the insects of the Banksian Cabinet were arranged in 1826 by the late Messrs. Bennett and Haworth. MM. Gory and Percheron state that their figure of the male is from a specimen in their possession. The above description of the species is compiled from the works of Fabricius, Olivier, and Gory. There appears however to be more than one specimen known, for Mr. Melly of Liverpool assures me that an insect of this species was lately exhibited for sale at Glasgow, and purchased by Sir William Hooker the Professor of Botany. Mr. Hope, however, is of opinion that Sir W. Hooker's species is different. Perhaps it is the male of *G. torquatus*. The above two normal sub-sections differ from the following aberrant sub-sections in not having the vitreous lustre of these last, but on the contrary, having a velvety aspect.

SP. (Cetonus) *Goliathus micans*, Drury.

DESCR. *Goliathus* viridi-nitens, antennis palpis tarsisque nigris.

♂ Clypeo lateribus unispinosis, cornu medio porrecto recurvo apice bifido.

♀ Clypeo simplice quadrato.

*Scarabaeus micans*, Drury, II. p. 59. tab. 32. fig. 3.

LONG. 25 lines.

NOTE. Both male and female are in my cabinet. I may here observe that the species is truly African, and that in Mr. Kirby's Introduction to Entomology, 2d edit. vol. iv. p. 506, *G. micans* is erroneously mentioned in place of *G. Inca*.—I have lately seen another species of the same sub-section larger than this, in the possession of Mr. Strachan who brought it from Sierra Leone. It is quite new, and differs from *Goliathus micans* in a broader form and in the clypeus being entirely black. The horn of the male is also quite different, approaching more closely to that of a *Coryphe*. I believe that gentleman intends to describe it.

SP. (Cetoninus) *Goliathus splendens*, n. s.

DESCR. *Goliathus* viridi-nitens, thorace punctis duobus cæruleis, elytris vix striatis lineâ obliquâ humerali cæruleâ.

♂ Clypeo lateribus bispinosis, cornu medio porrecto recurvo apice bifido.

♀ Incognita.

LONG. corp. 24 lines.

The male is in my cabinet. It is a species that comes very close to *G. micans*, and belongs to the same sub-section. Mr. Hope has given the name *Dicronorhina* to this sub-section; but for such minute groupes as the present, generic names are useless. Our grand object ought to be to demonstrate their affinities.

SP. (Cetoninus) *Goliathus Grallii*, *Buquet*.

DESCR. *Goliathus* viridi-micans, elytris flavo-circumdati.

♂ Capite tricorni, clypei cornu medio porrecto recurvo ad basin brunneo, caule rufo bifido ramis divergentibus extus arcuatiss reflexis apicibus dentatis.

♀ Incognita.

*Goliathus Grallii*, Ann. de la Soc. Ent. vol. vi. p. 201. tab. 5. fig. 3.

LONG. corp. 15 lines.

NOTE. This species I only know from the above description and figure of M. Buquet, who says that it was brought, as he believes, from Western Africa.

SP. 20. (Cetoninus) *Goliathus Smithii*, n. s.

DESCR. *Goliathus* vertice thorace scutelloque viridi-olivaceis, elytris testaceis suturâ margine maculisque duabus humeralibus duabus apicalibus abdominisque lateribus nigris; corpore infrâ ano pedibusque rufis, femoribus anticis intus hirsutie obtectis.

♂ Capite tricorni, clypei cornu medio porrecto recurvo rufo apice bifido, ramis divergentibus rectis.

♀ Capite quadrato simplice, clypeo rufo.

LONG. corp. 16 lines.

NOTE. This elegant species is now for the first time introduced to the notice of entomologists. Dr. Smith discovered it near the Tropic of Capricorn, and I have given it his name, as being that of a naturalist to whom every department of Zoology is most deeply indebted.

SP. (Cetoninus) *Goliathus Daphnis*, *Buquet*.

DESCR. *Goliathus* vertice thorace scutelloque viridi-micantibus, elytris aurantiis suturâ viridi margine maculisque duabus humeralibus duabus apicalibus nigris, corpore infra femoribusque viridibus, tibiis brunneis, tarsis nigris.

♂ Capite tricorni, clypei cornu medio brunneo porrecto recurvo bifido ramis extus arcuatiss.

♀ Capite quadrato clypeo viridi.

*Goliathus Daphnis*, Ann. de la Soc. Ent. vol. iv. p. 136. tab. 2. fig. 3-4.

LONG. corp. 14 lines.

NOTE. This species is a native of Senegal, and I only know it from the above description and figure.

SP. (Cetoninus) *Goliathus quadrimaculatus*, *Oliv.*

DESCR. *Goliathus* capite lato quadrato, thorace scutello corporeoque subtus viridi-nitentibus, clypeo elytris femoribusque suprà viridibus fulvo-micantibus, elytris maculis duabus humeralibus duabusque apicalibus nigris, pygidio fulvo.

♂ Clypeo antice concavo, cornu medio brevi recurvo apice dilatato triangulum obversum simulante.

♀ Clypeo quadrato antice subsinuato.

*Cetonia quadrimaculata*, Oliv. tab. 8. fig. 73.

*Gnathocera 4-maculata*, G. P. p. 131. tab. 19. fig. 4.

LONG. corp. 12 lines.

NOTE. Messrs. Gory and Percheron have figured the female from Mr. Hope's collection, taking it for a *Coryphe* (or as they erroneously call it, *Gnathocera*) to which sub-genus all the females of the Smithian section of *Goliathi*, so nearly approach. Olivier, Fabricius, and Schönnherr, seem also to have known only the female. On the other hand I possess only the male, and as my specimen has lost the last joint of all its tarsi, I cannot say whether the last joint of the anterior tarsus has a brush on the inside above the unguis or not. The species comes close on the confines of the following sub-section, as may be seen by the structure of the anterior tibiae of the male, which are not multidentate on the inside, according to the rule of the *Goliathi Smithii* in general. My friend Mr. Hope says that this species is identical with the *Goliathus Daphnis* of M. Buquet; but the last named entomologist is nevertheless right in considering the two to be distinct species, since the horns of the clypeus of the males are different as well as their anterior tibiae. *Goliathus Daphnis* in fact belongs to the same section as *G. Smithii*, and beautifully connects that species with the *Goliathus 4-maculatus*. So true it is, that while analysis is necessary for correct synthesis, sometimes also synthesis conducts us to correct analysis.

#### Section 2. HÖPFNERII.

69. This section I only know by M. Gory's description and figure of an insect from Mexico, in the collection of the Count Dejean, and called by him *Goliathus Höpfneri*. It seems to me to belong truly to the sub-genus *Goliathus*, differing from the section of *Smithii*, in the form of its head, and from the *Gigantei* in the form of its thorax, which is neither convex nor lobated behind the middle.

Sp. (*Cetoninus*) *Goliathus Höpfneri*, *Dej.*

DESCR. *Goliathus* clypeo nigro, corpore subtus thoraceque obscuris villo flavescente obtectis, elytris rufo-brunneis nigro-carnatis, femoribus subtus fulvis.

♂ Clypeo porrecto dilatato bifido, vertice transverso elevato, ramisque divergentibus.

♀ —————

*Goliathus Höpfneri*, *Dej. Cat. Ed. 3.* p. 188.

*Goliathus Höpfner*, *G. P. p. 154. tab. 26. fig. 2.*

NOTE. An unique specimen of the male is said to be in the collection of M. Dejean, and from Gory's description of it I have ventured to compile the preceding character. Little value however ought to be assigned to compilations of this kind, or indeed to any description which is not founded on actual inspection. I hope, therefore, that Comte Dejean will favour us soon with a detailed description and accurate figure.

#### Section 3. GIGANTEI.

70. These of all insects are the most esteemed by collectors, because they are exceedingly rare, and at the same time most conspicuous for their size and beauty. Even the rich collection of M. Dejean contains no specimen according to the last edition of his catalogue. I have known fifty guineas asked for *Goliathus giganteus*, and a specimen now in my collection is known formerly to have cost 29*l*. This section of the sub-genus is distinct from all the others, and, indeed, from all the other sections of the genus *Cetoninus*, in having the

terminal lobe of the maxilla armed on the inside at the middle with a corneous tooth. We thus have a character which clearly proves that these gigantic insects are aberrant, and that they pass off by the affinity of transmutation to the genus *Macrominus*, of which the maxilla, internally toothed, is an essential character. The gigantic *Goliathi* are, at first sight, easily distinguished from the *Höppnerii* by their back being convex, and they are known from that other section of the sub-genus which MM. Lepelletier and Serville have called *Inca* by the large and conspicuous axillary pieces or epimera of the mesothorax, (See Zool. Journal, vol. v. p. 165.) which intervene between, what is, to speak accurately, the prothorax and the shoulders of the elytra. The *Goliathi Gigantei* have a strong plantula\* between the unguis of the anterior feet, and probably it exists in all the feet. Unfortunately, my specimens, although good, are not in this respect thoroughly uninjured, and thus I am also ignorant whether the plantulae be attended or not with pseudonychia. The feet are all black, but the four posterior tibiæ are along the inside fringed with a close fulvous down, while the males have the anterior tibiæ thus lined only half way. The abdomen beneath is more or less covered with the same close down. The mesosternum is advanced, broad and pointed, something like a gothic arch. It is difficult to imagine how insects so large and weighty, can possibly live on flowers; at least the corolla, which would receive in its bosom any species of this section, must necessarily approach in size to that of the *Rafflesia*. These gigantic *Goliathi* may possibly live therefore on the juices that exude from the wounds of trees. One thing is sure, namely, that the penicilliform structure of the back of the terminal process of their maxillæ proves that they do live on juices of some kind. This section is confined to intra-tropical Africa, and, as far as I am aware, only two females of it have ever as yet been brought to Europe. There are, indeed, only five species of the section, with certainty known; and of all these five, I believe specimens may be seen in Great Britain. I shall now take the opportunity of distinguishing them, since some peculiar circumstances attending this magnificent group, give me the means of communicating information that certainly no other person possesses; and because I have now before me the very specimens described by Drury and Linnæus, and upon which specimens the genus *Goliathus* of Lamarck was originally founded.

SP. (Cetonus) *Goliathus Druri*, West.

DESCR. *Goliathus niger*, capite thoracisque vittis quinque elytrorum ferrugineorum basi scutello-que medio albis, vittæque thoracice marginalis maculâ nigrâ.

♂ Clypeo albo, lateribus unidentatis: dente latè emarginato, cornu medio porrecto bifido: ramis nigris divergentibus arcuatis apice dilatatis obliquè truncatis.

♀ Incognita.

*Scarabæus Goliathus*, Drury, vol. i. tab. 31.

\_\_\_\_\_, Linn. Syst. Nat. Mant. p. 530.

*Cetonia Goliathus*, Oliv. tab. 1. fig. 33.

LONG. 3 inches 6 lines.

NOTE. The above synonyms of the male are, I believe, the only original ones founded on actual inspection of the insect. The other writers who have touched on the subject, and they are not a few, have merely known the species from the above figures. Now the original specimen, from which all the above notices were taken, existed unique in Drury's collection, and was the first species of the Gigantic section ever published. I therefore consider it as the type. The specimen was found dead, and floating down the river

\* Professor Klug and Mr. Hope, who have given us figures and descriptions of the only two females of the section hitherto known, make not the slightest allusion to the existence of plantulae.

Gaboon, which is nearly on the equator, in front of the *Isla de Principe*. It passed by the public sale of Drury's Cabinet finally into that of my father, so that I am now in possession of the original specimen of this, as well as of the still more magnificent species *Goliathus giganteus*, with which it has in general been confounded. It has long been labelled in my cabinet as *Goliathus typus*; but I understand that in a new edition of Drury, lately published, Mr. Westwood has called it *G. Drurii*. I need scarcely say that MM. Gory and Percheron are mistaken when they assert that "Les types originaux du genre Goliath ne se trouvent dans aucune collection." Drury's figure of *G. Drurii* is good, except that it is coloured much too highly.

Sp. (Cetoninus) *Goliathus regius*, Klug.

DESCR. *Goliathus* subitus nigro-olivaceus, supra nigro-piceus, elytris ad suturam latè, margine, scutello utrinque, thoracisque vittis quinque albis, harum mediâ discali brevi tenui fusiformi, reliquis marginem thoraci posticum attingentibus, vittis marginalibus maculâ nigrâ.

♂ Ineditus.

♀ Capite nigro simplice subquadrato, angulis anticis rotundatis lunulisque ad basin duabus albis. *Goliathus regius*, Klug. Catalogue of Animals and Plants collected by A. Erman in his Voyage Round the World, p. 36. n. 87. tab. 15. fig. 7.

LONG. corp. 3 inches 6 lines.

NOTE. Professor Klug of Berlin has given us, in a work published in 1835, an excellent figure and elaborate description of the female of this new species, which was brought by Erman from the Isla de Principe in the Bight of Benin, and is now deposited in the Royal Museum of Berlin. As far as my recollection will now serve me, I believe it was a specimen of the male of this species which last year, under the name of "*Goliathus magnus*," was exhibited to a meeting of the British Association by Mr. Frederic Taylor of Liverpool. *Goliathus regius* comes exceedingly close to the next species *Goliathus giganteus*, and indeed principally differs from it in being of less size, and in the markings of the thorax, which are very distinct. The elytra are wonderfully alike in both, but the pure white scutellum of *G. giganteus*, and its white thorax, with six more or less abbreviated black longitudinal bands, may at once separate it from the present species *G. regius*, where the scutellum is black, having only a white mark on each side, and where the black thorax has five white longitudinal bands, of which the fusiform middle one neither reaches to the neck on one side, nor to the scutellum on the other, but is placed exactly in the middle. *G. regius* is at once to be known from *G. Drurii*, by the colour of the elytra. It is singular that Klug should have accurately separated this species from Drury's figure (vol. 3. tab. 40.) of *G. giganteus*, and yet have erroneously confounded *G. Drurii* with *G. giganteus*, although these are far more distinct. We may thus see, however, the advantage of the inspection of specimens over that of figures.

Sp. (Cetoninus) *Goliathus giganteus*, Lam.

DESCR. *Goliathus* subitus nigro-olivaceus, supra rosaceo-albus, thoraci vittis sex, exterioribus brevioribus, elytrorum vittâ discali latâ foveolâque minutâ versus suturam medianam irregulari nigris.

♂ Clypeo albo lateribus unidentatis; dente lateralí lato truncato, cornu medio porrecto bifido ramis nigris divergentibus apice dilatatis posticè acuminatis.

♀ Incognita.

*Scarabæus Goliathus*, var. ? Drury, vol. iii. tab. 40.

*Cetonia Goliathus*, var. β. Oliv. tab. 9, fig. 33.

LONG. corp. 3 $\frac{1}{2}$  inches.

NOTE. According to Drury, the specimen now before me came from Sierra Leone. I have seen another specimen of the male from that colony, of which a most wretched figure has been lately published in London, under the title of "*Cetonia Golianthus*." Drury's figure, on the other hand, is excellent in every respect. This entomologist suspected it to be a different species from that now called *G. Drurii*, by

the editor of a late edition of Drury's work. Fabricius, Olivier, Lamarck, and Klug, have all confounded the two foregoing species, and made them one, although the two first entomologists must have seen both specimens, although the original describer suspected them to be distinct; and although they will to the eye of any modern entomologist who inspects them, appear totally different from each other. The bifurcation of the extremity of the clypeus in the male, is of a different form from that of *Goliathus Druri*, inasmuch as the latter is curved backwards so as to resemble the Greek letter Υ, whereas in *G. giganteus* it resembles more the letter Y. The marking, colour, and size, are also so different, that one is really amused to find Klug, in a late publication,\* gravely laying down a theory to account for the two unique insects of Drury's Collection forming only one species. It is true that he never saw them; but he read in Drury's work that the former of these species (*Goliathus Druri*) was found dead, and floating on the surface of the river Gaboon. Catching at this fact, in the "Verzeichniss von Thieren und Pflanzen," which were collected by Adolph Erman in his voyage round the world, Klug says that the identity of the two species being fully proved by Drury's figures, which represent the clypeus porrected in both beetles, and the colouring of the thorax not essentially distinct, no regard ought to be paid by us to the very different colouring of the elytra, since the specimen figured by Drury, vol. i. t. 31., having been found dead in the water, may have lost its original white covering, and may thus appear to us now of a brown colour. Such reasoning is certainly ingenious, but the colouring of the thorax is very distinct, and, I will venture to say, that the clypeus will be found bifid and porrected even in the male of *G. regius* when known; and besides, I have pointed out sufficient differences to make it certain that Drury was right when he suspected his two unique specimens to belong to different species. I am not much inclined to adopt Lamarck's trivial name "giganteus," because he applied it to both species, *G. Druri* and this; nor can I adopt Klug's trivial name "imperialis," for, in fact this is in like manner applied by its author to an imaginary being, made up of the two foregoing species united, which, be it observed, neither he nor Lamarck ever saw. In my specimen of *G. giganteus* there are two small black spots on the hinder part of the thorax which is quite white, the two middle vittæ being abbreviated. In the other specimen which I have seen, the two middle black vittæ reach to the hinder margin of the thorax, and the two small black spots above mentioned become connected with the other vittæ on each side. Mr. Kirby, in his Introduction to Entomology, vol. iv. p. 506, alludes to some private letter of mine to him, in which mention was made of *Goliathus giganteus*. I suppose, therefore, that at the time of writing that letter, I assigned the name which Lamarck has given both to *G. Druri* and this, to the latter species alone.

Sp. (Cetonus) *Goliathus Cacicu*s, Oliv.

DESCR. *Goliathus niger*, thorace flavescente vittis sex abbreviatis nigris, exterioribus brevioribus, scutello flavo, elytris albido-glaucis margine humerali subtriangulari nigris.

♂ Clypeo albo lateribus unidentatis, dente lato truncato, cornu medio porrecto bifido ramis nigris divergentibus apice dilatatis obliquè truncatis.

♀ Incognita.

*Scarabæus Cacicu*s, Voet. Col. tab. 22. fig. 151.

*Cetonia Cacicu*s, Oliv. tab. 3. fig. 22.

LONG. corp. 3 Inches 6 lines.

NOTE. This insect, like the last, is truly from Africa, as Professor Klug perceived. The first describers of it, however, made it to be an American species, and so dubbed it "a Cacique." The original specimen is said to be at Glasgow in the Hunterian Museum. I believe Mr. Hope possesses one in spirits, and I have seen another in the National Museum at Paris. Of this last we have an excellent figure given by M. Gory. *Goliathus giganteus* comes exactly between this species and *G. regius*, for if we look at the marking of the thorax, we find *G. giganteus* to agree with *G. Cacicu*s, and if we look at

\* Reise um die Erde ausgeführt von Adolph Erman.

the marking of the elytra, we find *G. giganteus* to agree with *G. regius*. The three species are very close to each other; but *G. Druri* is so different from them all, as almost to form another sub-section of Gigantic *Goliathi*.

Sp. (Cetoninus) *Goliathus Princeps*, *Hope*.

DESCR. *Goliathus nigro-piceus*, thorace vittato etc. (Vide *Hope's Coleopterist's Manual*.)

♂ Incognitus.

♀ Clypeo simplice sub-quadrato antice subsinuato, maculis duabus verticalibus fere mediis fulvis.

*Goliathus princeps*, *Hope*, Col. Man. p. 117.

LONG. corp. 3 inches.

NOTE. Mr. Hope has given a figure and an excellent detailed description of this insect, of which an unique female specimen exists in his collection. To his work I refer the reader for observations on the section, as well as on the species. Although it remains doubtful whether this be not the female of *C. Cacicus*, I am, for my part, inclined to believe Mr. Hope to be in the right when he considers it as the female of a new species.

71. In concluding my remarks on this interesting section, I have to state that it corresponds exactly with the limits which Professor Klug, in the Appendix to Erman's Voyage, above mentioned, has assigned to his genus *Goliathus*. Nevertheless, I consider the most typical *Goliathi*, in other words, those species of *Goliathus*, which are most distinct from all other species of their common genus *Cetoninus*, to be contained in the section *Inca*. Thus *Inca* is aberrant when we refer to the sub-genera of *Cetoninus*, but on the other hand it is typical when we are referring it to the sections of *Goliathus*.

#### Section 4. INCA, Lepell. et Serville.

72. This groupe has been most properly placed by MM. Latreille and Kirby, among the *Goliathi* of Lamarck. But MM. Gory and Percheron have more lately, with a singular taste for affinities, interposed between *Inca* and the other sections of *Goliathus*, not only the sub-genera *Platygenia* and *Cremastocheilus*, but I know not what besides. The section of *Goliathus*, called *Inca* by MM. Lepelletier and de Serville, has the back even more convex than that of any of the gigantic *Goliathi*; but it may easily be known from all the rest of the sub-genus by its proximity to the genus *Trichinus*. It is, in fact, the *Trichinus* form of the sub-genus *Goliathus*, and by it the genera *Cetoninus* and *Trichinus* meet so as to close that circle which constitutes the family of *Cetoniidae*. The section may be characterized by its labrum, which is almost lobate in the middle, by the subcircular convex thorax with denticulated margin, by the convex elytra, by the internal spine of the fore femur, by the epimeron not being prominent between the thorax and elytra, and, finally, by the bicornuted clypeus of the male, although this last character is not to be considered by any means as peculiar to the groupe. Here it may be noticed with respect to the whole sub-genus *Goliathus*, that I consider the true clypeus of the groupe, that is, the clypeus of the female, which is nearly of the same form and construction throughout the various sections, to be in all essentially quadrate, having the anterior angles in general sharp, and the fore-margin rather concave. This general form of clypeus becomes horned in two ways. In the section of *Gigantei*, the trunk of the bifid horn proceeds from the middle of the emargination of the anterior margin of the clypeus, and what are called the lateral teeth, are merely the angles of the quadrate clypeus. In the section of *Smithii*, particularly in *Goliathus Polyphemus*,

we see that in the male these angles of the clypeus project into horns on each side of the large central horn. In the present section, *Inca*, but still more in the next section, which Mr. Hope has marked out under the name of *Dicronocephalus*, the male has no horn proceeding from the middle of the margin of the clypeus, but only those horns which arise from the angles of the clypeus. *Inca* is a section entirely confined to South America. I shall now content myself with the enumeration of the species described by authors, and merely observe that my collection is in want of specimens of *G. bifrons*, *rufipennis*, and the male of *Goliathus Ynca*, Fab.

Sp. (Cetonina) *Goliathus Ynca*, *Fab.*

*Cetonia Ynca*, *Fab.* *Syst. Eleuth.* vol. ii. p. 136.

*Inca Ynca*, *G. P.* p. 103. tab. 13. fig. 1.

NOTE. This species possesses the thorax marked in that very peculiar way which so singularly characterizes the Gigantic section.

Sp. (Cetoninus) *Goliathus bifrons*, *Fab.*

*Cetonia bifrons*, *Oliv. tab. 12.* fig. 117.

*Inca bifrons*, *G. P.* p. 107. tab. 14. fig. 2.

Sp. (Cetoninus) *Goliathus barbicornis*, *Lat.*

♂ *Goliathus barbicornis*, *Cuv. Regne Animal*, vol. iv. p. 187. tab. 13. fig. 1.

*Inca barbicornis*, *G. P.* p. 105. tab. 13. fig. 2.

♀ *Cetonia pulverulenta*, *Oliv. tab. 10.* fig. 95.

Sp. (Cetoninus) *Goliathus irroratus*, *G. P.*

*Inca irrorata*, *G. P.* p. 106. tab. 14. fig. 1.

Sp. (Cetoninus) *Goliathus fasciatus*, *Kirby.*

♂ *Goliathus fasciatus*, *Kirby, Linn. Trans.* vol. 12. p. 407.

♀ *Inca serricollis*, *G. P.* p. 108. tab. 14. fig. 3.

NOTE. The *Goliathus inscriptus* of Kirby appears to be only a variety of this species.

Sp. (Cetoninus) *Goliathus rufipennis*, *G. P.*

*Inca rufipennis*, *G. P.* p. 109. tab. 14. fig. 4.

NOTE. I am aware that MM. Gory and Percheron assign some of the above names to certain of their private friends. But I find it convenient for quotation to consider the true namer of an insect to be that person in whose work I find it for the first time described.

#### Section 5. DICRONOCEPHALI, *Hope.*

73. This section is Asiatic, and has the sides of the elytra nearly parallel. It agrees with the last in having the anterior tibiae furnished externally with teeth in both sexes, but it differs in having the epimeron more or less prominent between the angles of the thorax and elytra. It agrees with the section of *Smithii* in its body being depressed, but then the male has never the anterior tibiae internally multidentate. Between the anterior unguis there is a plantula in form of spine, which is armed at the apex with diverging pseudonychia. The mesosternum is not much produced between the legs, and sometimes is barely visible. The horns of the head seem, as I have said before, to be productions of the lateral teeth of the clypeus in the Gigantic section, that is, of the angles of the female clypeus, and the bifurcated horn of the middle of their clypeus is wanting. The section admits of the following sub-sections:—

	<i>Sub-sections.</i>	<i>Types.</i>
1 * * * * *		
2 Horns of head dentated. Thorax sub-circular. Anterior tibiæ externally more or less tridentate. <i>G. Wallichii</i> , <i>G. P.</i>		
3 * * * *		
4 * * * *		
5 Horns of head not dentated. Thorax sub-elliptical. Anterior tibiæ externally bidentate.		<i>G. opalus</i> , <i>Dup.</i>

Sp. (Cetoninus) *Goliathus Wallichii*, *G. P.*

DESCR. *Goliathus glauco-flavidus*, oculis, unguibus, ano, thoracis lineis duabus abbreviatis, liturisque elytrorum duabus humeralibus duabus apicalibus nigris.

♂ Clypeo antice cavo, bicornuto, cornubus resupinis supra dentatis apice bifidis, clypei linea verticali pedibusque ferrugincis.

♀ Clypeo antice bidentato, vittâ verticali pedibusque nigris.

*Goliathus Wellech* ♂. *G. P.* p. 154. tab. 26. fig. 1.

LONG. 12 lines.

NOTE. It is but just to Dr. Wallich, after whom I suppose this insect was named, to correct the mistake which M. Gory has made in the orthography of his name. I have both sexes in my collection, from Nepaul. In one specimen of the male, the upper tooth of the anterior tibia is evanescent, so as to make it appear externally sub-bidentate.

Sp. (Cetoninus) *Goliathus opalus*, *Dupont.*

DESCR. *Goliathus nitidus flavescentis viridi-micans*, thorace vagè punctato viridi-ignescente, tarsum articulis apice unguibusque nigris.

♂ Clypeo antice cavo, bicornuto, cornubus productis triquetris supra haud dentatis apice antrosum arcuatis.

♀ \_\_\_\_\_

*Narycius opalus*, Dupont, Mag. Zool. Cl. ix. p. 128.

NOTE. In Guerin's Magazine, M. Dupont gives the figure and description of an insect from Madras, which he places in a new genus, called by him *Narycius* and *Naricius*. He gives no distinct character to the genus, but describes two species, of which, although they are exceedingly close to each other in affinity, I suspect his *Narycius olivaceus* to belong rather to the sub-genus *Coryphe*. The present species (his *Narycius opalus*) is curious, as being exactly intermediate between *Goliathus Wallichii*, *G. P.*, and those brilliant green *Goliathi* which form the beauty of the section which I have called *Smithii*. Thus do we return to those *Goliathi* with the description of which we commenced our observations on this rich and rare sub-genus. I must, however, before I leave the groupe, call attention to the curious analogy that exists between *Goliathus opalus* and *Lamprima aenea*, and remark how the clypeus in one takes the form of the mandibles of the other, making Latreille fancy that they were annexent genera. I need scarcely observe that the *Goliathus opalus* must not be confounded with the *Goliathus opalinus* of Gory, which is a *Coryphe*.

74. Of true *Goliathi*, I consider that the above-mentioned species may be accounted as distinctly known. But we have now to return to the aberrant groupe of *Goliathi Gigantei*, and we may observe a Cape insect, which M. Gory has described under the name of *Diplognatha concava*, to present several points of structure held by it in common with those gigantic beetles. Like them this insect has a three-horned clypeus, although the horns are here considerably modified, particularly the central one, which is short and trifid. The anterior tibiæ are externally tridentate, as in the females of the gigantic *Goliathi*, but here they differ, in being tridentate in both sexes. The body is likewise convex. The thorax is rounded. The scutellum is sharp. The epimeron is prominent between the elytra and thorax. The mesosternum is short, broad,

and sub acuminate at apex. The pseudonychia are large and conspicuous. The mentum, however, is here not deeply emarginate as in *Goliathus*, but, on the contrary, rather convex in front, so that we have arrived at another sub-genus which has been called *Ichnestoma*, by M. Gory; but as this gentleman has favoured us with the derivation of the word which he intended to write, I shall correct his mistake, and call the

*Sub-genus 4. Ischnostoma, G. P.*

75. It is true, that taking a more extended view of natural affinities than M. Gory, I have given greater latitude, than he has done, to the groupe here called *Ischnostoma*, but I do not, on that account, conceive myself entitled to deprive that entomologist of the credit of naming this curious sub-genus. *Ischnostoma* is distinguished from *Goliathus*, by the mentum never being deeply emarginate, and from the sub-genus *Cetonia*, by the terminal lobe of the maxilla being excessively small, and almost evanescent. This lobe, as may be expected, is largest in the two aberrant sections which lead to *Goliathus* and *Cetonia*; but still is short, in proportion to what we find it to be in those two sub-genera generally. The mandibles here are peculiarly small and rudimentary, as is also the labrum, which is of a singular form in the typical sections,—a form which indeed is different from that of the labrum in all other *Cetoniidæ*. The mentum is never emarginate, but in general convex at the apex. All the known species are of a black hue, that makes them little interesting except to the entomologist. From the grains of sand which I have generally found adhering in quantity to the hair which covers the under side of many of these insects, we may imagine that they are inhabitants of a sterile country. Schönnherr, Latreille, and, more lately, Klug, have all placed certain insects which belong to this sub-genus close to the genus *Goliathus* of Lamarck.

*SECTIONS OF ISCHNOSTOMA.*

B.—Epimeron distinctly visible between the elytra and thorax. Mentum never with an acute apex.	<table border="0"> <tr> <td style="vertical-align: top;">1 CŒLOCEPHALÆ, M'L.</td><td>Clypeus horned. Mentum convex in front.</td></tr> <tr> <td style="vertical-align: top;">2 XIPHOSCELIDÆ, M'L.</td><td> <table border="0"> <tr> <td>Clypeus not horned. Thorax narrower than elytra. Mentum broader in front.</td></tr> </table> </td></tr> <tr> <td style="vertical-align: top;">3 ARCADEÆ, M'L.</td><td> <table border="0"> <tr> <td>Clypeus not horned. Thorax at base as wide as the elytra. Mentum sub-emarginate.</td></tr> </table> </td></tr> </table>	1 CŒLOCEPHALÆ, M'L.	Clypeus horned. Mentum convex in front.	2 XIPHOSCELIDÆ, M'L.	<table border="0"> <tr> <td>Clypeus not horned. Thorax narrower than elytra. Mentum broader in front.</td></tr> </table>	Clypeus not horned. Thorax narrower than elytra. Mentum broader in front.	3 ARCADEÆ, M'L.	<table border="0"> <tr> <td>Clypeus not horned. Thorax at base as wide as the elytra. Mentum sub-emarginate.</td></tr> </table>	Clypeus not horned. Thorax at base as wide as the elytra. Mentum sub-emarginate.
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76. The first of these sections, here called *Cœlocephalæ*, contains two known species which MM. Gory and Percheron have erroneously assigned to their genus "*Diplognatha*." The *Cetonia geotrupina* of Schönnherr is possibly a third distinct species. The maxilla here, however, has no tooth on the inner process, like *Diplognatha*; and if there be any thing like a tooth on the outer process, of which I am not quite sure, it appears to be merely the acute corner of the horny part which stretches beyond the pencil of hairs. However, I think this must be an approach in some degree to the structure of *Diplognatha*; and although I am not prepared to say with M. Gory that it belongs to that sub-genus, I certainly consider it as evidently serving to connect the genera *Macrominus* and *Cetoninus* by what is called the

affinity of transmutation. I conceive *Macrominus* to approach *Cetonus* somewhere between the gigantic *Goliathi* and the celocephalous *Ischnostomæ*. I shall now therefore place here the following species brought home by Dr. Smith, and which is very curious, on account of its mentum being something like that of a *Cremastocheilus*.

Sp. 21. (*Cetonus*) *Ischnostoma concava*, G. P.

*Diplognatha concava*, G. P. p. 121. tab. 17. fig. 4.

NOTE. This appears to be the insect alluded to by M. Latreille in the second edition of the *Regne Animal*, as a *Goliathus* brought from the Cape by M. Verreaux. *Diplognatha albopunctata* of Gory, which is also a Cape insect, is evidently to be placed in the same section. So also is the *Cetonia geotrupina* of Bilberg, which both Schönnherr and Latreille consider to be a *Goliathus*, (See *Syn. Ins. App.* p. 46. 69.) Professor Klug has stated likewise his opinion that the *Diplognatha albopunctata* of Gory, and the *Cetonia geotrupina* of Schönnherr come close to the gigantic *Goliathi*. They are, in fact, only to be distinguished from them by their porrected clypeus, which, like that of *Goliathus*, has a central horn with a smaller lateral tooth on each side. Here, however, this middle horn is trifid, and the maxilla is of a different structure.

77. The second section, *XIPHOSCELIDÆ*, has for its type an insect in my collection, which I suspect to be from Swan River in Australia. It is remarkable for its small round thorax, long arched posterior legs, incrassated femora, and for the apex of the posterior tibiae being produced into a strong curved spine. The mouth agrees nearly with that of the following section.

78. The third section, *ARCADEÆ*, comes very close to the sub-genus *Cetonia*, so close indeed as almost to make one suspect that it may form part of the Trichoid section of that sub-genus; nevertheless, the smallness of the mandibles and of the terminal lobe of the maxillæ induce me to place it here. It is a group peculiar to the Cape, and offers two sub-sections, which completely agree in the organs of their mouth.

*Types.*

B.—Body convex. Thorax not horned.  $\left\{ \begin{array}{l} 1 * * * \\ 2 \text{ } Ischnostoma sanguinipes. \\ 3 * * * \end{array} \right.$

A.—Body depressed. Thorax subcornute in the male.  $\left\{ \begin{array}{l} 4 \text{ } Ischnostoma cornuta. \\ 5 * * * \end{array} \right.$

Both the above species have been brought from the Cape by Dr. Smith, and I shall therefore enumerate them.

Sp. 22. (*Cetonus*) *Ischnostoma sanguinipes*, G. P.

*Cetonia sanguinipes*, G. P. p. 254. tab. 48. fig. 4.

NOTE. This is an insect that is almost as much a *Cetonia* as an *Ischnostoma*. I am not sure whether *Cetonia sanguinipes* and *C. talpina* of Klug, ought to be considered as distinct species, but I think that they are not the same.

Sp. 23. (*Cetonus*) *Ischnostoma cornuta*, Fab.

*Cetonia cornuta*, Fab. Syst. Eleuth. vol. ii. p. 143.

*Scarabaeus Arcas*, Oliv. tab. 9. fig. 83.

*Cetonia cornuta*, G. P. p. 252. tab. 48. fig. 2.

NOTE. MM. Gory and Percheron say of *Ischnostoma cornuta* as follows: "Cette espèce quoique très anomale par la forme ne nous a paru susceptible de former un genre propre; les parties de la bouche la rapprochant tout à fait des vraies Cetaines." This is quite correct; the only difference between this species and the true *Cetoniae* being the cornuted thorax, and the comparative minuteness of the terminal lobe of the maxillæ. It is truly osculant, between *Ischnostoma* and *Cetonia*, and comes close to the

*Cetonia hispida* of Olivier. There is no affinity to the genus *Syrichtus* whatever, or to any of the *Dynastidæ*. The relation between them is one of analogy.

79. The fourth section is from the Cape, and is, like the fifth, typical of *Ischnostoma*. I have called it HETEROCLITÆ, because I suspect the insect described by M. Gory as "*Ischnostoma heteroclyta*" will be found to belong to it. A species of this section has been brought home by Dr. Smith ; but, like that of the Museum of Natural History at Paris, is in sad preservation. I must here observe, that M. Gory's figure of *Ischnostoma albomaculata* is singularly incorrect, and therefore I am led to infer that the figure of *I. heteroclyta* is incorrect also ; the more so as M. Gory's description of the heads of these two insects does not agree with his figures.

Sp. 24. (*Cetoninus*) *Ischnostoma spatulipes*, n. s.

DESCR. *Ischnostoma atronitida*, capite porrecto clypeo quadrato margine reflexo apice emarginato lobis rotundatis, corpore valde convexo, thorace subsemicirculari punctato marginato, scutello magno, elytris sub-rugosulis apice subtruncatis, metasterno brevissimo truncato, tibiis anticis extus tridentatis, calcaribus posticis spatuliformibus.

LONG. 10 lines.

NOTE. This species may be the *C. cordata* of Fabricius. It has an indentation in the centre of the thorax, being the first vestige of the deep one that exists in *Ischnostoma cornuta*.

80. The section CUSPIDATÆ is, like the last, singular for its trichoid form, but differs in the body being more depressed, and in the clypeus being of a very peculiar form, owing to its extreme length, and the sides of it being at the base deeply emarginate. The feet are also longer and less strong ; but both sections are remarkable for a long narrow labrum, which, however, is exceedingly minute in proportion to the size of the insect.

Sp. 25. (*Cetoninus*) *Ischnostoma pica*, n. s.

DESCR. *Ischnostoma atroviolacea* velutina punctata, pilis nigris operta, thoracis vittis marginalibus elytrorumque vittâ marginali humerum nec suturam medianam attingente albis, corpore infra atronitido, pygidio maculis duabus albis magnis, pedibus nigerrimis calcaribus posticis acutis.

LONG. 10 lines.

NOTE. This species is very close to the *Cetonia cuspidata* of Fabricius, but there are no "puncta duo cinerea inter antennas," and the whole of the margin of the thorax is not cinereous. Whether *Ischnostoma pica* be identical with the *Melolontha albomarginata* of Herbst, I know not ; but certainly it is very different from the *Ischnostoma albomaculata* of Gory, which is in my collection. But we now return to the section of *Arcadeæ*, which, as I said before, comes so close to the *Cetonia hispida* of Olivier. By this section we arrive at the

#### Sub-genus 5. CETONIA, G. P.

81. This groupe is typical of the genus *Cetoninus*, and contains perhaps more species than all the rest of the family of *Cetoniidæ* put together. *Cetonia* may be distinguished from *Goliathus* by the males not being horned, but having their clypeus of the same shape as that of the females. The anterior tibiæ are also similar in the sexes, which distinguishes the sub-genus from *Schizorhina*, to which it closely approaches. From *Ischnostoma*, *Cetonia* may be separated by the sub-quadratus and emarginate mentum, and by the long penicilliform terminal process of the maxillæ. In *Cetonia* the plantula between the unguis appears to be generally present, only it is apt to be rubbed off by use. The pseudonychia do not seem always to be

present. This sub-genus has been left in disorder by Gory and Dejean, because it is very difficult to be sub-divided. I offer the following rough approximation to the truth :—

*SECTIONS OF CETONIA.*

B.—Pseudonychia apparent.	$\left\{ \begin{array}{l} 1 \text{ TRICHOIODEÆ, M'L.} \\ 2 \text{ TYPICÆ, M'L.} \\ 3 \text{ GYMNETIDEÆ, M'L.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Clypeus almost always entire. Elytra hirsute. Fore tibiæ} \\ \text{tridentate. Plantula with two pseudonychia.} \\ \\ \text{Clypeus entire. Elytra not hairy. Plantula with one} \\ \text{pseudonychion.} \\ \\ \text{Clypeus more or less cloven. Elytra smooth and polished.} \\ \text{Plantula with two pseudonychia.} \end{array} \right.$
A.—Pseudonychia inconspicuous.	$\left\{ \begin{array}{l} 4 \text{ POLYBAPHEÆ, K.} \\ 5 \text{ CREMASTOCHEILIDEÆ, M'L.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Fore tibiæ externally bidentate.} \\ \text{Fore tibiæ often externally subtridentate.} \end{array} \right.$

82. Of the trichoid section of *Cetonia*, I believe no species comes from Asia or New Holland. It represents the genus *Trichinus*, and therefore all the typical species of it have the elytra, or at least the lower surface of the body, covered with hair. Fabricius placed one species of this group in his genus *Trichinus*. The TRICHOIODEÆ, for the present, may be sub-divided as follows :—

*Sub-sections.*

A.—Body rather depressed.	$\left\{ \begin{array}{l} 1 \text{ Capenses.} \\ 2 \text{ Europeæ.} \end{array} \right.$	Type, <i>C. capensis</i> , Fab.
B.—Body rather convex.	$\left\{ \begin{array}{l} 3 \text{ Americano-boreales.} \\ 4 * * * * \\ 5 \text{ Americano-meridionales.} \end{array} \right.$	Type, <i>C. stictica</i> , Fab. Type, <i>C. areata</i> , Fab. Type, * * * * Type, <i>C. lurida</i> , Fab.

83. We have principally to do with the first of these sub-sections, which contains a number of Cape species brought home by Dr. Smith ; such as

Sp. 26. (Cetoninus) *Cetonia pubescens*, Oliv.

*Cetonia pubescens*, Oliv. tab. 11. fig. 100.

— — — — — G. P. p. 259. tab. 49. fig. 4.

Sp. 27. (Cetoninus) *Cetonia hispida*, Oliv.

*C. hispida*, Oliv. tab. 12. fig. 110.

— — — — — G. P. p. 260. tab. 47. fig. 5.

NOTE. The French give me the credit of calling this species “ ferrea.”

Sp. 28. (Cetoninus) *Cetonia albopicta*, G. P.

*C. albopicta*, G. P. p. 256. tab. 49. fig. 1.

Sp. 29. (Cetoninus) *Cetonia capensis*, Lin.

*Scarabœus capensis*, Linn. Syst. Nat.

*Cetonia capensis*, G. P. p. 257. tab. 49. fig. 2.

Sp. 30. Cetoninus (*Cetonia*) *hirsuta*, n. s.

DESCR. *Cetonia rufa*, capite nigro punctato fasciâ hirsuto, thoracis albopunctati pilis vestiti vittis marginalibus scutello elytrorumque suturâ nigris, scutello punctis duobus albis.

*Thorax* vittis marginalibus albopunctatis, vittâ mediali rufâ trianguli punctis duobus albis. *Elytra* pilis raris albis vestita. *Pygidium* nigrum maculis intermediis duabus rufis, later-

alibus minoribus albis. *Corpus* infra nigrum hirsutie flavâ opertum. *Abdomen* vittâ mediâ rufâ. *Pedes* nigri.

LONG. 9 lines.

Sp. 31. (Cetoninus) *Cetonia oculata*, *n. s.*

DESCR. *Cetonia rufa* capite, scutello, scapulis, thoracis albpunctati maculis duabus, elytrorumque suturâ nigris, corpore infrâ hirsuto, abdominis rufi maculis lateralibus pedibusque nigris.

LONG. 9 lines.

NOTE. This may possibly be the *Cetonia Ræuperi* of Dejean's Catalogue. It comes very near to the preceding species *C. hirsuta*, and may possibly even be only a variety of it. The place of both is between *C. capensis* and *C. signata*, Fab.

Sp. 32. (Cetoninus) *Cetonia signata*, *Fab.*

*C. signata*, Fab. Syst. Eleuth, vol. ii. p. 245. 42.

— G. P. p. 248. tab. 49. fig. 3.

Sp. 33. (Cetoninus) *Cetonia tigrina*, *Oliv.*

*Cetonia tigrina*, Oliv. tab. 12. fig. 111.

NOTE. Schönnherr makes the *Cetonia furcata* of Fabricius to be synonymous with this, but I am far from being sure of their identity.

Sp. 34. (Cetoninus) *Cetonia bella*, *n. s.*

DESCR. *Cetonia atrovelutina*, vertice albo bimaculato, clypeo quadrato argenteo bimaculato antice vix emarginato angulis rotundatis, thorace albomaculato vitta laterali irregulari albâ, scutello albo-bimaculato, elytris albo maculatis maculis seriatim dispositis, ano albo-4-maculato maculis intermediis elongatis, corpore subtus atronitido abdominis lateribus albo-bimaculatis, pedibus atronitidis, tibiis anticis vix tridentatis, femoribus posticis albo-lineatis.

LONG  $5\frac{1}{2}$  lines.

84. We now proceed to the European sub-section of Trichoid *Cetoniae*; and here we find two Cape species at the entrance.

Sp. 35. (Cetoninus) *Cetonia funesta*, *Fab.*

*Cetonia funesta*, Fab. Syst. Eleuth. 2. 155. 103.

NOTE. This species is different from the *Cetonia stictica* of Fabricius, although confounded with it by Gory.

Sp. 36. (Cetoninus) *Cetonia melæna*, *n. s.*

DESCR. *Cetonia atra* punctata, clypeo quadrato antice subemarginato, thorace subquadrato lateribus rotundatis carinâ mediâ lœvi, elytris striis inter tres lineas elevatas lœves impressis, tibiis anticis vix tridentatis.

LONG. 5 lines.

85. With respect to the section of *Cetonia* which I have termed CREMASTOCHEILIDÆ, I may safely say that it deserves the name; for, in fact, these several sections of the sub-genus represent the five genera of the family; and thus the extraordinary similarity in colour and marking that is found to exist between such insects as *Cremastocheilus maculatus*, G. P., and *Cetonia maculata*, Fab., may be accounted for. This section of *Cremastochelidæ* is peculiar to Asia and Africa, and offers various sub-sections, which for the present may be distributed as follows:—

*Sub-sections.*

B.—Fore tibiæ externally tri-dentate.	$\left\{ \begin{array}{l} 1 \text{ Elytra spinous at apex. Fore tibiæ scarcely with three teeth on the outside.} \\ 2 \text{ Elytra spinous at apex. Fore tibiæ with three distinct teeth.} \\ 3 \text{ Elytra not spinous at the apex.} \end{array} \right\}$	Type, <i>C. acuminata</i> , Fab.
Asiatic.	2	Type, <i>C. alboguttata</i> , Vigors.
	3	Type, <i>C. histrio</i> , Fab.
A.—Fore tibiæ externally bi-dentate.	$\left\{ \begin{array}{l} 4 \text{ Elytra with parallel sides. Clypeus quadrate, scarcely emarginate in front.} \\ 5 \text{ Elytra narrower at apex. Clypeus elongate, acuminate with emarginate apex.} \end{array} \right\}$	Type, <i>C. aerifera</i> , M'L.
African.	5	Type, <i>C. haemorrhoidalis</i> , Fab.

86. Of the three first sub-sections, we have no species brought by Dr. Smith, as they are typically Asiatic. I shall merely therefore take the opportunity of mentioning that M. Schönnherr is wrong in stating *C. acuminata* to be a native of the Cape, and that MM. Gory and Percheron are equally wrong in stating *C. maculata* to be a Cape species. The former inhabits India, and the latter the Mauritius. Many insects are said to be natives of the Cape of Good Hope, merely because they have been brought from thence.

87. Of the fourth sub-section of *Cetonia Cremastocheilideæ*, we have several Cape species in the collection ; such as,

Sp. 37. (Cetoninus) *Cetonia numismatica*, n. s.

DESCR. *Cetonia* clypeo anticè rotundato, capite thoraceque violaceo-aeneis, scutello elytrisque aeneis fusco-maculatis, his striis punctorum tribus inter tres vittas lœves elevatas impressis, corpore subtus nigro villoso, abdomine pedibusque fulvo-aeneis, ano nigro maculis cinerascentibus.

LONG. 6 lines.

Sp. 38. (Cetoninus) *Cetonia aerifera*, n. s.

DESCR. *Cetonia* clypeo anticè rotundato, capite thoraceque violaceo-aeneis, hujus margine postico scutello elytrisque ferrugineis; his striis geminatis impressis nigro-maculatis, scutello ad basin scapulisque nigris, ano ferrugineo albomaculato, corpore subtus nigro-nitido villoso, femoribus posticis ad tibias rufescentibus.

LONG.  $5\frac{1}{2}$  lines.

Sp. 39. (Cetoninus) *Cetonia puma*, n. s.

DESCR. *Cetonia* antennarum clavâ elongatâ, clypeo elongato antice rotundo, capite thoraceque obscuris subaeneis, thoracis vittâ laterali albescente maculâ nigrâ, scapulis albis, scutello elytrisque ferrugineis, his inter tres lineas elevatas lœves nigro-maculatis, lateribus albomaculatis, corpore subtus aeneo squamis albis obsito pilisque hirsuto, ano rufo albomaculato.

LONG  $5\frac{1}{2}$  lines.

Sp. 40. (Cetoninus) *Cetonia cinerascens*, Fab.

*Cetonia cinerascens*, Fab. Syst. Eleuth. 2. 156. 104.

*Scarabaeus cinereo-nebulosus*, Degeer, vii. 643. tab. 48. fig. 7.

NOTE. The *Cetonia cinerascens* of Gory is not that of Fabricius. Degeer's original name for the present species is too clumsy.

88. Of the fifth sub-section, which is also peculiar to Africa, we have the following species:—

Sp. 41. (Cetoninus) *Cetonia adspersa*, Weber.

*Cetonia adspersa*, Weber, Obs. Ent., p. 71, 8.

— G. P. p. 297, tab. 57, fig. 7.

Sp. 42. (Cetonius) Cetonia dysenterica, n. s.

DESCR. *Cetonia* clypeo elongato apice angustato recurvo emarginato, capite thorace scapulis scutelloque nigro-nitidis, elytris viridibus nigro-lineatis, corpore subtus pedibusque nigris, ano ferrugineo.

LONG. 5 lines.

Sp. 43. (Cetoninus) *Cetonia haemorrhoidalis*, Fab.

*Cetonia haemorrhoidalis*, Fab. Syst. Eleuth. 2, 154, 97.

G. P., p. 298, tab. 57, fig. 8.

Sp. 44. (Cetoninus) *Cetonia ruficollis*, Deg.

*Scarabaeus ruficollis*, Degeer, vii, 642, tab. 48 fig. 5.

Sp. 45. (Cetoninus) Cetonia amethystina n. s.

10. (*Cetonia*) *Cetonia amethystina*, M. & S.  
DESCR. *Cetonia* thorace supra punctato rufo, margine postico scutello scapulisque nigris, elytris  
amethystinis nitidis striato-punctatis, corpore subtus nigro, prothorace anque rufis, pedibus  
nigris.

LONG. 5 lines.

Sp. 46. (Cetoninus) *Cetonia rubra*, *Deg.*

*Scarabæus ruber*, Degeer, vol. vii. 643. tab. 48. fig. 6.

*Cetonia rubra*, G. P. p. 299. tab. 58. fig. 1.

89. Let us now return to that Asiatic sub-section, the type of which is *C. histrio* of Fabricius. From it we may proceed to that section of the sub-genus *Cetonia*, which answers nearly, though not exactly, to a groupe which Mr. Kirby has indicated under the name of *Polybaphes*. If this learned entomologist had attempted to give his *Polybaphes* a character, he probably would not have joined *C. histrio* with *C. aequinoctialis*; but nothing is so easy as to follow the indolent plan invented by M. Dejean of giving to groupes generic names unaccompanied by descriptions. I hold in utter contempt that privilege of naming for which naturalists are so much in the habit of squabbling; and, on the contrary, am always grateful to those persons who kindly provide me with an unobjectionable word. Nevertheless, I am bound to protest against any name that is published without a character; since it ought not to be of the slightest authority in the science. It certainly is not the individual placing two Greek words barbarously in juxtaposition who deserves the credit of discovering a genus, but he who accurately distinguishes the groupe, to which that barbarous name is given, from all others. With respect, however, to the beautiful groupe which Mr. Kirby has called *POLYBAPHES*, I am disposed to retain the name, and shall merely therefore say, in addition, that I am acquainted with three sub-sections of it.

A.—Elytra spinose at the 1 \* \* \* \*

apex.

*African.* 3 Head triangular. Clypeus scarcely emarginate.

Type, *C. sanguinolenta*, Oliv.

Type, *C. discoidea*, Fab.

B.—Elytra without spines at  $\int_1$  \* \* \* \* \*

the annex.

5 Head sub-quadrate. Clypeus emarginate.

Type. *C. marginicollis*, G. P.

The following Cape species belong to the third sub-section :—

Sp. 47. (Cetonus) *Cetonia balteata*, *Degeer*.

*Scarabaeus balteatus*, *Degeer*, vii. 642. tab. 48. fig. 4.

*Cetonia controversa*, *G. P.* p. 246. tab. 46. fig. 6.

NOTE. I do not allude here to Schönnherr, because his "Synonymia Insectorum" is altogether wrong with respect to the species of this particular section *Polybapheæ*.

Sp. 48. (Cetonus) *Cetonia discoidea*, *Fab.*

*Cetonia discoidea*, *Fab.* Syst. Eleuth. 2. 158. 116.

*Cetonia velutina*, *Oliv.* tab. 12. fig. 114.

————— *G. P.* p. 246. tab. 46. fig. 5.

*Cetonia flammea*, *Zool. Journ.* vol. 2. p. 237. tab. 9. fig. 2.

90. As this last-mentioned section of the sub-genus *Cetonus* bears a resemblance in form to *Diplognatha*, and represents the genus *Macrominus*, so the section to which we now pass bears a strong resemblance to *Lomaptera* in the genus *Gymnetinus* which is here represented. This section I have therefore called **GYMNETIDÆ**, and it belongs typically to Madagascar, although found also in New Holland. There are several known sub-sections; but as they present no Cape insects, I need not detail them here. I shall only say, that the *Cetonia* *Gymnetidæ*, by their beautiful form and polished flat elytra, with serrated sides, by their often cloven clypeus, long maxillæ, and emarginate mentum, close the circle of the genus *Cetonus* by uniting themselves with the sub-genus *Schizorhina*, and thus forming the junction between it and the sub-genus *Cetonia*.

91. By means of *Cetonia cincta* of Donovan, we arrive at the only remaining section of *Cetonia*, which I have called **TYPICÆ**, not because they are typical of the sub-genus, but because they represent the genus *Cetonus*, as it were, *par excellence*. This section is so numerous as to offer sub-sections, which, however, as may be expected, depend on very refined and even evanescent considerations. Perhaps, however, I have not yet been able to seize the true characters of distinction; and, indeed, it is of little consequence, provided I can explain the series of affinity, which appears to me to be as follows :—

B.—Typically European.	{ 1 Black. 2 Viridiæneous. 3 Viridiæneous spotted with white.	Type, <i>C. morio</i> , <i>Fab.</i> Type, <i>C. fastuosa</i> , <i>Fab.</i> Type, <i>C. aurata</i> , <i>Lin.</i>
A.—African.	{ 4 Green with white or yellow lines. 5 Yellow or black spotted with yellow.	Type, <i>C. aulica</i> , <i>Fab.</i> Type, <i>C. sinuata</i> , <i>Fab.</i>

92. As we have no species from the Cape of the three first sub-sections, I shall begin with the one which is here numbered the fifth, and designated "Nigra flavomaculatæ vel flavæ." To this beautiful African group belong the following described species :—1. *Cetonia punctatomarginata*, *Degeer*; *C. impressa*, *G. P.*; *C. inscripta*, *G. P.*; *C. marginata*, *Fab.*; *C. postica*, *G. P.*; *C. fimbriata*, *G. P.*; *C. monacha*, *G. P.*; *C. fasciata*, *Fab.* (*Savigny*, *G. P.*); *C. olivacea*, *Ol.*; *C. interrupta*, *Fab.*, &c. &c.; and also the following species brought from the Cape by Dr. Smith :—

Sp. 49. (Cetonus) *Cetonia sinuata*, *Oliv.*

DESCR. *Cetonia nigrofusca*, thoracis elytrorumque margine, thoracis maculis quinque, scutelli duabus, elytrorumque quatuor flavis, thoracis maculis marginalibus elytrorumque duabus nigro-fuscis, corpore subtus nigro.

NOTE. This well known species is subject to very great variation in the discal spots of the thorax, which are all five placed in a triangle thus  $\triangle$ ; the two reniform middle ones being the largest and most constant, although even they will sometimes disappear.

VAR.  $\alpha$ . Thorax with only the two reniform middle spots. *Cetonia sinuata*, G. P. p. 182.

NOTE. I do not here refer to Gory's figure, because it wants these two thoracic yellow spots, although they are expressly mentioned in his description.

VAR.  $\beta$ . Thorax without any discal yellow spots. *Cetonia sinuata*, G. P. tab. 32. fig. 5.

VAR.  $\gamma$ . Thorax wanting the vertical yellow point, but having the four lower.

NOTE. In this variety the triangular lower yellow spots of the elytra extend so as almost to meet the corresponding enlargement of the marginal vitta, and thus to form as it were a band.

VAR.  $\delta$ . Thorax wanting the two lower spots, but having the three vertical ones.

NOTE. I may here observe that the *Scarabaeus punctato-marginatus* of Degeer, appears, as Schönnherr thought, to be another variety of *C. sinuata*, Fab. It is in my collection, and may be easily known by having no yellow points either on the thorax or scutellum. I am in possession of a series of specimens, that makes me think the following species communicated by Mr. Hope to MM. Gory and Percheron, may only be another variety; although it is more in consonance with nature to imagine that all these varieties are formed, like those of certain flowers, by the crossing of two very contiguous species, the two parents of all the intermediate varieties being as it were, *C. sinuata*, as I have described it, and the *C. flaviventris* of MM. Gory and Percheron.

SP. 50. (Cetoninus) *Cetonia flaviventris*, *Hope*.

*Cetonia flaviventris*, G. P. p. 178. tab. 31. fig. 6.

SP. 51. (Cetoninus) *Cetonia leonina*, n. s.

DESCR. *Cetonia supra atro-viridis*, thorace elytrisque flavo-marginatis, elytrorum limbo medio dilatato bifurcato maculisque discalibus obliquis subinterruptis flavis, corpore subtus ferrugineo, ano albomaculato.

LONG.  $9\frac{1}{2}$  lines.

NOTE. This species comes the nearest to *Cetonia impressa* of Goldfuss and Gory, but differs much in the marking of the elytra. Being in possession of that species also, I have had no difficulty in determining the distinction that exists between the two.

SP. 52. (Cetoninus) *Cetonia carmelita*, *Fab.*

*Cetonia carmelita*, G. P. p. 238. tab. 45. fig. 2.

NOTE. This is the *C. badia* of Burchell; and most likely Schönnherr is right in considering it to be the *Scarabaeus rufus* of Degeer. It is easily known from other three species that come very close to it, by the two large white anal spots.

SP. 53. (Cetoninus) *Cetonia bachypinica*, *Burchell*.

*Cetonia bachypinica*, G. P. p. 237. tab. 45. fig. 1.

NOTE. The testaceous or yellow colour of this species, passes off in some varieties to green. And I wish to remark here, in general, that the black colour of some African species, such as *C. marginata*, Fab. for instance, becomes brick red, as in *C. carmelita*, Fab. and passes off to ochry yellow, as in *C. bachypinica*, which again passes into green, as in *C. aulica*, Fab., and so to the viridiæneous colour, such as *C. fastuosa*, Fab. which returns to black, as in *C. morio*, Fab.

93. We shall now proceed to the last sub-section we have to allude to among the *Cetonia* typicæ, that is, to those species which are generally of a green colour, and are marked with white or yellow lines. Dr. Smith has brought the following:—

SP. 54. (Cetoninus) *Cetonia semipunctata*, *Fab.*

*Cetonia semipunctata*, G. P. p. 233. tab. 44. fig. 3.

*Cetonia Stephensii*, Zool. Journ. vol. 2. p. 513. tab. 19. fig. 2.

SP. 55. (Cetoninus) *Cetonia chalca*, *Herbst.*

*Cetonia chalca*, G. P. p. 235. tab. 44. fig. 5.

SP. 56. (Cetoninus) *Cetonia aulica*, *Oliv.*

*Cetonia aulica*, G. P. p. 236. tab. 44. fig. 6.

NOTE. This species varies in the number of white spots on the elytra, but may always be known by three that are placed in a transverse oblique line on each elytron, and by the two large triangular white spots on the anal plate.

SP. 57. (Cetoninus) *Cetonia nympha*, *n. s.*

DESCR. *Cetonia viridis*, nitida, capite quadrato vix emarginato, vertice ad oculos albo-bimaculato, prothoracis punctati margine laterali, elytrorum vix striato-punctatorum maculâ humerali longitudinali, aliis quinque marginalibus duabusque discalibus albis, elytris apice triangulari depresso, scapulis maculâ albâ, ano maculis duabus emarginatis albis, corpore subtus piloso, prothorace mesothorace et metathorace subtus albo-bimaculatis, mesosterno viridi, abdominis segmento ultimo bimaculato tribusque penultimis quadrimaculatis maculis albis, pedibus viridibus.

LONG.  $10\frac{1}{2}$  lines.

SP. 58. (Cetoninus) *Cetonia fascicularis*, *Linn.*

*Cetonia fascicularis*, G. P. p. 255. tab. 48. fig. 6.

NOTE. We thus return to *Cetonia pubescens*, and those other species having the elytra, or at least the body covered with hair, and which form that section of the sub-genus *Cetonia* which I have termed *Trichioideæ*. Thus, therefore, the circle composed of the five sections of *Cetonia* is complete.

94. We have now gone through a complete revision of all the sub-genera composing the family of *Cetoniidæ*, and which are as follow ; the sub-genera, in *italics*, being those by which the passage is made from one genus to the other.

1 TRICHINUS.	2 CETONINUS.	3 GYMNETINUS.	4 MACROMINUS.	5 CRYPTODINUS.
1 <i>Osmoderma</i> .	1 <i>Schizorhina</i> .	1 <i>Lomaptera</i> .	1 <i>Oplostomus</i> .	1 <i>Genuchus</i> .
2 <i>Valgus</i> .	2 <i>Coryphe</i> .	2 <i>Agestrata</i> .	2 <i>Anoplocheilus</i> .	2 <i>Cyclidius</i> .
3 <i>Trichius</i> .	3 <i>Goliathus</i> .	3 <i>Philistina</i> .	3 <i>Diplognatha</i> .	3 <i>Cremastocheilus</i> .
4 <i>Campulipus</i> .	4 <i>Ischnostoma</i> .	4 <i>Macronota</i> .	4 <i>Gnathocera</i> .	4 <i>Cryptodus</i> .
5 <i>Platygenia</i> .	5 <i>Cetonia</i> .	5 <i>Gymnetis</i> .	5 <i>Macroma</i> .	5 <i>Cymophorus</i> .

Were nature to set before our eyes every one of these groupes in a state as complete, for instance, as is that section of *Cetonia* which I have called *Typicæ*, we should, of course, have of the *Cetoniidæ* 125 sections and 625 sub-sections, &c. &c. But this is not the case ; since, from some unexplained cause, each groupe of the same rank contains a different number of species, and thus throughout the creation we see certain parts of the chain comparatively complete in all their links, and others again offering nothing but objects which appear to the superficial observer at first sight to be insulated, and, in fact, require deep study on the part of the naturalist before he is enabled to make out their accurate affinities. It is needless to repeat that I, as well as others before me, have imagined the cause of this insulation of particular objects to arise from the connecting species having been either lost or undiscovered.

95. The conclusion to which we tend by such an analysis as the foregoing, is, that the lowest

groupe in which species combine will be found, provided all the species are known, to return into itself, so as to form, as it were, a circle ; and if we could suppose no species to be lost or to remain undiscovered, we should further find five of these lowest groupes to form another circle, and five of these last circular groupes to form another, and so on until we arrived at that grand circular groupe which is called the Animal Kingdom. But setting aside this theoretical use of the foregoing analysis, the practical entomologist will soon discover that in no other way have we ever had the singularly complicated relations, that exist between the different species of the natural family of *Cetoniidæ*, so well represented. It must not be supposed, however, that I offer this essay as perfect and complete, or that I absurdly pretend, as some have most unjustly laid to my charge, to have positively arrived at the *Natural System*. I merely publish this paper on *Cetoniidæ*, as another, and perhaps closer approximation to that Divine plan, which, every hour I have devoted to nature, whether in tropical forests or in the museums of Europe, has shewn to be the branch of natural history most worthy of being studied by rational beings. But the truth is, that this Divine plan is not one particular branch of natural history, but the study of it necessarily includes the knowledge of every branch. It is the whole, of which each branch of natural history is but a part, and which I shall ever regard with gratitude, as having been the source of many moments of the purest pleasure while my residence was in an unhealthy climate.

## ON THE BRACHYUROUS DECAPOD CRUSTACEA.

BROUGHT FROM THE CAPE BY DR. SMITH.

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THE most interesting observations on Crustaceous animals which have of late years been given to the public are those of Dr. Vaughan Thompson, relating to their metamorphosis. It had been long recorded that many *Entomostraca* undergo metamorphosis; but no naturalist before Thompson ever ventured to affirm that crabs, lobsters, and the higher *Crustacea* generally, pass through certain changes of form after leaving the egg. It is true, that in consequence of the publications of Professor Rathke, some persons disputed the truth of Dr. Thompson's assertions; but so far as my own observations allowed me to form an opinion on the subject, I was ever inclined to think that this gentleman merited well of science, which is far more than could be said of any of those persons who by crude inferences, but never by direct observation, ventured to attack him.\* I have never myself lived sufficiently near the sea-side to enable me conveniently to repeat Dr. Thompson's experiments; but looking merely to what I have seen with my own eyes, I think it will eventually be found that the *Ptilota* of Aristotle may be characterized by their change of form taking place during their last two or three stages of ecdysis; while the metamorphosis of all other *Annulosa* only occurs during the first or second moult after leaving the egg. When I come to treat of the *Macrourous Decapods*, I shall return to this subject. At present my attention must be more particularly confined to the classification of the *Brachyura*, as being the best known groupe of all *Crustacea*.

M. Latreille and Dr. Leach left systems behind them for the arrangement of *Crustacea*, which were professedly artificial, although the former naturalist made several praiseworthy attempts to arrange these animals naturally. Since the death of these eminent naturalists, two authors have appeared with higher pretensions to acquaintance with the class. The first of these, M. Milne Edwards, having previously made some ingenious observations on the economy and internal anatomy of *Crustacea*, has lately, in the "Suites de Buffon," produced a classification, of which I can only say, that it makes an approach to be a rare exception to the well-known fact, that professed comparative anatomists are the persons, of all others, who in general are the most incapable of using their own observations for purposes of natural arrangement. And indeed this very arrangement of Edwards is not natural, since he unfortunately conceives that every groupe he can invent, provided he can furnish it with a character, must be therefore a good one. As, on the contrary, the true definition of a complete natural groupe is, that it must be a series returning into itself, many of the groupes of Milne Edwards, when weighed by this scale, will be found wanting. For instance, of his four grand groupes, *Oxyrhynques*, *Cyclometopes*, *Catometopes*, and *Oxystomes*, perhaps only his *Cyclometopes* form a

\* The credit of confirming Thompson's observations belongs to my friend Captain Ducane, R. N., who has made at Southampton most interesting observations on the Metamorphosis of *Crustacea*, which I trust he will soon give to the Public.

complete natural groupe. Still the “*Histoire Naturelle des Crustacés*” is a book full of facts, which ought to be in the hands of every carcinologist. The second naturalist, above alluded to, is Professor Dehaan of Leyden. He has treated the subject in another manner, and deserves to be considered of a more philosophic stamp. What he has published on *Crustacea* in the *Fauna Japonica* is a magnificent tribute to science. Milne Edwards rarely takes notice of any of the maxillæ, except the external or fifth pair; and if any objection can be made to Dehaan's arrangement, it is that he likewise is not sufficiently eclectic, and appears to make too much use of the organs of manducation. Nevertheless, as he rigorously follows the mode in which these organs vary, and not that by which they might arbitrarily be combined, it is satisfactory to find that the result, generally arrived at, very nearly approaches to the plan of nature. Nothing further has been published on *Crustacea* of late years, unless we except some interesting descriptions of new species by MM. Say, Guerin, Bell and others. As for M. Dehaan's system, it is not completely worked out; so that I am obliged to offer the following arrangement, provisionally, as being that by which I have been able to express the affinities which exist among the *Decapods* of my own collection. It will at least serve to unite all those relations, whether of affinity or analogy, which have been recorded by Latreille, Milne Edwards, and Dehaan, and will prove that, by means of a moderate exercise of patience, order may sometimes be made to arise out of an apparent chaos.

1. The modern art of describing is too often insufferably long, while human life remains short as ever. I shall endeavour, therefore, as in the former paper, to condense my descriptions as much as possible.

### Order DECAPODA, Lat.

#### Tribes.

<i>Normal Groupe.</i>		
<i>BRACHYURA</i> , Lat.	{	1 TETRAGONOSTOMA.
Abdomen having no appendages attached to the penultimate segment. Internal antennæ lodged in fossulæ.		2 TRIGONOSTOMA.
<i>Aberrant Groupe.</i>		
<i>MACROURA</i> , Lat.	{	3 ANOMURA, M.E.
Abdomen having appendages attached to the penultimate segment. No fossulæ for the reception of the internal antennæ.		4 SAROBANCHIA.
		5 CARIDEA, Lat.
		{ Oral orifice broad in front. The afferent canals of the branchial cavity opening behind the mouth. Epistome distinct.
		{ Oral orifice triangular and narrow in front. The afferent canals of the branchial cavity opening in front of the mouth. Epistome in general rudimentary.
		{ Abdomen not furnished with false natatory feet. Abdominal appendages not forming a natatorial tail. Branchiæ lamellate. Peduncle of external antennæ not covered by any moveable scale.
		{ Abdomen furnished with false natatory feet. Abdominal appendages forming a natatorial tail. Branchiæ penicilliform. Peduncle of external antennæ with its scale null or rudimentary.
		{ Abdomen furnished with false natatory feet. Abdominal appendages forming a natatorial tail. Branchiæ lamellate. Peduncle of external antennæ covered by a large moveable scale.

2. It is only with the normal groupe that we for the present have to concern ourselves. I shall therefore proceed provisionally to arrange the *Brachyura* into Stirpes, merely observing, that in

the following descriptions I shall rarely allude to colour, since experience has taught me that in this respect dried specimens of *Crustacea* are not to be trusted. I would also observe, that as the groupes of degree next inferior to families—namely, genera—have never been worked out in this class, I have for the present considered almost all the various groupes under families to be sub-genera, although some of them, such as *Plagusia*, may possibly be a true genus, and others again may prove to be only sections of some sub-genus. I do not think that our collections, as yet, possess a sufficient quantity of species to allow us to decide what are the genera and what are the sub-genera of Decapod *Crustacea*. Professor Dehaan, however, has offered some valuable hints on the subject, and to those I refer the reader. We appear to enter among the *Brachyura* by the genus *Mycterus*, and to leave it by means of the genus *Ranina*. There are ten Brachyurous stirpes, which may be placed in two columns, so as to shew those analogies which by Milne Edwards and others have too often been taken for affinities.

TETRAGONOSTOMA.	Analogies.	TRIGONOSTOMA.
<i>Mycterus</i> .. <i>PINNOTHERINA</i> .	Shell orbicular.	<i>DROMIINA</i> — <i>Ranina</i> .
<i>GRAPSINA</i> .	Shell quadrilateral.	<i>DORIPPINA</i> .
<i>CANCRINA</i> .	Shell arcuated with feet often natatory.	<i>CORYSTINA</i> .
<i>PARTHENOPINA</i> .	Shell uneven with crested feet.	<i>CALAPPINA</i> .
<i>INACHINA</i> .	Shell sub-triangular and generally spined.	<i>LEUCOSINA</i> .

3. The analogy between certain *Inachina*, such as *Acanthonyx*, and certain *Leucosina*, such as *Nursia*, is so great as to have induced M. Latreille to imagine that a direct affinity existed between the two groupes. In general, the above analogies appear reversed; but the Tetragnostomous stirpes may be characterized as follows:—

### TRIBE TETRAGONOSTOMA.

#### Stirpes.

<i>Normal Groupe.</i>		
<i>OXYRHYNCHA</i> , M. E.	1 <i>INACHINA</i> . Triangular Crabs.	{ First joint of external antennæ very large, forming the greater part of the lower side of the orbit, and always soldered to the clypeus.
Epistome very large. Clypeus generally advanced in front.	2 <i>PARTHENOPINA</i> . Rocky Crabs.	{ First joint of external antennæ small, not soldered to the clypeus and not aiding to form the lower side of the orbit of the eye.
<i>Aberrant Groupe.</i>	3 <i>CANCRINA</i> . Arched Crabs.	{ Tigellus of external pedipalps always inserted at the inner angle of their third joint. The scapes of the palpi undivided on the inside. Shell arched in front.
<i>BRACHYRHYNCHA</i> .	4 <i>GRAPSINA</i> . Square Crabs.	{ Tigellus of external pedipalps inserted at the outer angle, or at the middle of the third joint. The scapes of palpi not dentated. Shell quadrilateral.
Epistome short. Clypeus rarely advanced in front.	5 <i>PINNOTHERINA</i> . Parasitical Crabs.	{ Tigellus of external pedipalps always inserted at the summit, or at the outer angle of their third joint. The scapes of the palpi not dentated. Shell orbicular.

4. By *Eury nome* we pass from the *Inachina* to the *Parthenopina*; by means of *Æthra* we pass from the *Parthenopina* to the *Cancrina*; from these to the *Grapsina* by *Thelphusa*; from the *Grapsina* to the *Pinnotherina* by means of *Doto*; and from the *Pinnotherina* we return to the *Inachina* by means of *Elamene*. The following appear to be the families of *Ina-*

*china*, which, as well as the *Parthenopina*, have the genital organs of the male hollowed out in the first joint of the hind feet.

### Stirps INACHINA, or TRIANGULAR CRABS.

#### Families.

<i>Normal Groupe.</i>	$\left\{ \begin{array}{l} 1 \text{ INACHIDÆ, M'L.} \\ 2 \text{ EURYPODIDÆ, M'L.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Tigellus of external pedipalps inserted at the outer angle of} \\ \text{their third joint.} \end{array} \right.$
<i>MACROPODIDÆ, M. E.</i> Feet long and slender.	$\left\{ \begin{array}{l} 3 \text{ EPIALTIDÆ, M'L.} \\ 4 \text{ MITHRACIDÆ, M'L.} \\ 5 \text{ HUENIDÆ, M'L.} \end{array} \right.$	$\left\{ \begin{array}{l} \text{Tigellus of external pedipalps inserted at the inner angle of} \\ \text{their third joint.} \end{array} \right.$
<i>Aberrant Groupe.</i>		$\left\{ \begin{array}{l} \text{Eyes not concealable; no orbitary groove.} \\ \text{Eyes concealable in an orbitary groove. Clypeus bifur-} \\ \text{cate in the middle.} \\ \text{Eyes concealable in an orbitary groove. Clypeus pointed} \\ \text{in the middle.} \end{array} \right.$
<i>MALE, M. E.</i> Feet of the ordinary size.		

5. Of the two first families I have no species from the Cape to describe. I proceed therefore to the third

#### Fam. EPIALTIDÆ, Mihi.

##### Sub-genus. ANTILIBINIA, M'L.

*Cephalothorax* short, convex, pear-shaped, as broad almost as long, with the sides dentated in front, and the clypeus short, triangular, with a bidentated apex, having a smaller tooth on each side.

*Orbit* without any distinct fossula.

*Eyes* minute, somewhat prominent, but scarcely moveable, and having a very short peduncle. *Exterior antennæ* longer than the clypeus, with their first joint reaching its middle, and being three-sided at the apex, while the second and third joints are cylindrical, and the rest are short and setaceous.

*Internal antennæ* inserted at the base of the rostrum, and having their basilar joint obconical and rather three-sided, while their second joint is shorter and cylindrical.

*External pedipalpi*, or fifth pair of maxillæ, with their outer palpus semifusiform, and the inner palpus having the second joint elongated with parallel sides, the third joint subquadrate, and the tigellus very small, inserted at its inner angle.

*Feet*, first pair twice as long as body, with the chelæ thick, having subacute digits, which are serrulated on the inside. The hinder pairs of feet are more slender.

*Abdomen* wanting in my specimen, which is a male.

This groupe I have called *Antilibinia*, because it is in the family *Epialtidæ* exactly what *Libinia* is in the family *Mithracidæ*. It is only analogous to *Libinia*, for it has no grooves or orbit for the concealment of the eyes, which besides are neither moveable nor retractile. *Libinia* is a groupe peculiar to the New World; but whether it and *Antilibinia* are sub-genera, or only sections of sub-genera, remains to be proved.

Sp. 1. (—) *Antilibinia Smithii*, n. s.

Pl. 2.

DESCR. *Antilibinia* testæ margine laterali anticè tridentato, clypeo bifurcato cornubus intùs pilosis.

**NOTE.** The shell of this species is without hairs, almost circular, and has the regions in general distinct. The clypeus is bifurcated with a tooth on each side of the base. The anterior lateral margin of the shell has three teeth, of which the foremost is situated behind the eyes; the second or middle tooth is the greatest, and directed forwards, while the last is little more than a tubercle. The digestive region has an eminence marked on each side. The branchial region has five or more tubercles on each side. The cardial region has a tubercle in the middle behind, and on each side of it there is an oblique portion of the shell scabrose. The horns of the clypeus are pilose on the inside. The digits of the chelæ have seven or more teeth on the inside. The four pair of hind feet have their third joints thick, and are armed with long curved claws. This crab resembles the *Libinia spinosa* of Milne Edwards so closely, that at first sight it might be taken for it.

*Sub-genus. ACANTHONYX*, Lat.Sp. 2. (—) *Acanthonyx dentatus*, M. E.*Acanthonyx dentatus*, Hist. Nat. des Crust. vol. i. p. 343.Sp. 3. (—) *Acanthonyx scutellatus*, n. s.DESCR. *Acanthonyx* fere duplo longior quam latus, orbitæ angulo externo unidentato, clypeo ad basin tuberculis duobus setiferis suprà instructo, testæ margine laterali bidentato dente posteriori minimo apice subsetifero.

**NOTE.** The shell of this fine species, which is more than an inch long, is shaped like an heraldic shield. It is depressed. The two horns of the clypeus are pilose at their apex, and have two setiferous tubercles at their base. On each side of these horns, and at the external angle of the orbits, there is a triangular tooth also pilose at the apex. The anterior lateral margins of the shell are bidentated. The fore teeth on each side are large, triangular, and blunt. From their points the sides of the carapace proceed towards the posterior margin, nearly parallel to each other, until they arrive at the second tooth, which is rudimentary, and reduced to a setiferous tubercle. The posterior margin of the thorax is rounded.

## Fam. MITHRACIDÆ, Mihi.

*Sub-genus. DEHAANIUS*, M'L.

*Cephalothorax* subtriangular, with the lateral margins in front dentated, and behind rounded; the clypeus being quadridentate.

*Orbit* simple, with globose moveable eyes, thicker than their peduncles.

*Exterior antennæ* with the basilar joint broad at the base, then narrower and reaching the middle of the clypeus; while the second joint is shorter and obconical.

*Internal antennæ* with the basilar joint subcylindrical, and the second subtriangular.

*External pedipalpi* with the outer palpus falciform, and the inner palpus having its second joint with subparallel sides, the third joint sub-quadratae, emarginate at the apex, with the tigellus conspicuous, inserted at its inner angle.

*Feet*, first pair thicker than the rest, and having the digits serrulated on the inside ; the second pair longer than the first, and, as well as the three posterior pair, it is furnished with a subcheliform penultimate joint, which is truncated at the apex, and unidentated.

*Abdomen* of male has seven segments.

This groupe is in the family *Mithracidæ* exactly what *Acanthonyx* is in the family *Epiatidæ*. Both are analogous groupes in contiguous families ; but whether they ought to be considered as sub-genera, or only sections of sub-genera, remains yet to be discovered.

Sp. 4. (—) *Dehaanius acanthopus*, n. s.

DESCR. *Dehaanius* testâ glabrá, margine laterali anticè tridentato, dente medio majore, clypeo fossulâ inter dentes duos medios maiores longitudinali.

NOTE. Carapace pyriform and without hair, having the digestive, cardiac, and branchial regions distinct. Anterior lateral margin tridentate, the middle tooth being much the largest. Clypeus short, with four triangular divergent teeth, the two in the middle being the largest and farthest advanced. From the middle bifurcation of the clypeus there is a deep groove continued about half its length backwards. The feet are without hairs. The chelæ of forefeet are thick, and serrulated on the inside. The other four pair of feet have thick knees, and subcheliform claws. The only specimen brought home by Dr. Smith has lost of the external antennæ all but the two first joints.

*Sub-genus. MITHRAX*, Leach.

Sp. 5. (—) *Mithrax quadridentatus*, n. s.

DESCR. *Mithrax* cornubus rostri divergentibus ad apicem arcuatis, extus bidentatis dente apicali multo majore ; testâ triangulari supra granulosâ, haud spinosâ, marginibus lateralibus anticis quinquidentatis.

NOTE. Carapace and feet exactly like those of *Mithrax dichotomus*, Lat., to which this species comes exceedingly close. The anterior lateral edges of the shell are armed on each side, as in *M. dichotomus*, with seven spiniform teeth ; but the hinder two of these teeth are evanescent, and are placed more on the back. There are, moreover, no points on the hinder edge of the carapace, as in *M. dichotomus*. The eyes are globular, and larger than the base of the pedicles. The antennary fossa has no tubercle at the posterior edge. The anterior feet are long, having the third and fourth joints covered with short spines : the fifth joint or hand is slender and smooth, as is also the moveable finger without teeth. The other feet have no tooth at the extremity of the third joint. The size is  $1\frac{1}{2}$  inch.

6. By means of *Eury nome* we proceed to the PARTHENOPINA ; but of this groupe no species has been brought from the Cape ; so we avail ourselves of *Cryptopoda* to pass on to *Aethra*, and so among the Cancrina, of which the families appear to be as follow. All these families are distinguished by having the scapes of the palpi of the fifth maxillæ unidentated on the outside ; and their males have the genital orifices hollowed out in the first joints of the hind feet.

## Stirps. CANCRINA, or ARCHED CRABS.

## Families.

<i>Aberrant Groupe.</i>	<i>XANTHIDÆ, M'L.</i>	{ Outer lacinia of third maxillæ dilated at the apex. Shell arched in front.
<i>CANCERIDÆ, M. E.</i>	<i>CANCRIDÆ, M'L.</i>	{ Outer lacinia of third maxillæ narrow at the apex. Shell arched in front.
Hind feet with claws. Body thick.	<i>ERIPHIDÆ, M'L.</i>	{ Outer lacinia of third maxillæ narrow at the apex. Shell quadrilateral, or at least but little arched in front.
<i>Normal Groupe.</i>		
<i>PORTUNIDÆ, M. E.</i>	<i>PORTUNIDÆ, M'L.</i>	{ Outer lacinia of third maxillæ with the inner apex emarginate. Last joint of hind feet more or less round.
Hind feet dilated, and formed for swimming. Body depressed.	<i>CARCINIDÆ, Leach.</i>	{ Outer lacinia of third maxillæ with the inner apex entire. Last joint of the hind feet more or less acuminate at the apex.

I proceed to enumerate the following Cape species, which belong to this Stirps :—

## Fam. XANTHIDÆ, Mihi.

## Sub-genus. ATERGATIS, Dehaan.

Sp. 6. (—) *Atergatis compressipes*, n. s.

DESCR. *Atergatis* testâ rubrâ lævi fulvo-maculatâ clypeo vix quadrilobo; chelis intus compressis, digitis suprà carinatis extus lineis elevatis duabus instructis, pedibus brevibus latis compressis fulvô-maculatis.

NOTE. The shell of this crab is about two inches long, and about twice as wide as long, of an oval form, very convex, and having only the branchial regions distinctly marked. The surface is quite smooth, of a dirty orange hue, marked with brick-red spots. Of these, one large spot, of an irregular form, reaches over the genital region almost the whole width of the shell. Another smaller spot marks the cardiac region, and the remainder of the shell is covered with small round spots of the same hue, which are also found on the feet. The seven-jointed abdomen of the female is also marked with small fulvous spots.

The margin of the clypeus is sinuated so as almost to show four rudimentary lobes. The chelæ at their points are blackish; on the fixed joint there are two elevated lines on the outside. The other feet are very much compressed and dilated. In other respects the characters are those common to all the species of the groupe named *Atergatis* by Professor Dehaan. This species is two inches long.

## Sub-genus. CHLORODIUS, Leach.

Sp. 7. (—) *Chlorodius perlatus*, n. s.

DESCR. *Chlorodius* testâ rugis divisâ, suprà granulosâ granulis albis, marginibus lateralibus anticis quadrilobis; clypeo quadrilobo manibus pedibusque crassis rugosis verrucosis, chelis apice translucentibus, pedibus brevissimis.

NOTE. This species comes very near the *Chlorodius areolatus* of Milne Edwards, but may be

distinguished from it by the anterior lateral margin being in this crab scolloped, instead of having four triangular teeth. The whole of the feet also are granulose, which is not the case in *C. areolatus*. The length is about eight lines. This is not the *Chlorodius* of Dehaan.

*Sub-genus. HALIMEDA*, Dehaan.

Sp. 8. ( ——— ) *Halimede pisifer*, n. s.

DESCR. *Halimede* testâ villosâ antice tuberculatâ postice scabrosâ, clypeo subacuminato, manibus pedibusque infrâ glaberrimis lèvissimis, hirsutie tuberculisque pisiformibus extus opertis, chelis nigris.

NOTE. This species is only seven lines long. The thorax is convex in the middle, having the anterior lateral margins scolloped by four blunt tubercles. The front is sub-acuminate, with the apex crenated. The chelæ are unequal in size, but both large. The abdomen is covered with hairs, except the last joint.

This species has affinity to the *Polydectus cupulifer* of Milne Edwards, agreeing with it, in having three great tubercles surrounding each orbit, one occupying its external angle, and the two others the lower edge of the orbit.

7. Of the family CANCRIDÆ we have no species; we pass on therefore to the following—

Fam. ERIPHIDÆ, Mihi.

*Sub-genus. ERIPIA*, Lat.

Sp. 9. ( ——— ) *Eriphia Smithii*, n. s.

DESCR. *Eriphia* testâ posticè albopunctatâ regionibus distinctis, lateribus antice tuberculatis, clypeo haud spinoso, lobis duobus mediis quinque-tuberculatis, manibus tuberculosis chelis concoloribus, pedibus hispidis.

NOTE. This species of *Eriphia* has its carapace well marked by the regions. The whole of it towards the margin, except behind, is covered with tubercles; the rest of the surface is granulose. The lateral margin is strongly tuberculated, and the two last tubercles behind the orbits are almost spines. The margin of the orbit is tuberculated. The margin of the two middle lobes of the four-lobed clypeus has five tubercles for each. The fore-feet are one larger than the other. The larger being marked above by tubercles sparingly scattered, and the smaller being strongly verrucose above and below. The chelæ of the former has strong teeth; those of the latter have scarcely any, and cross each other. The feet are spotted with white above, are hispid, but have no tubercles. The length is more than two inches. The abdomen of the male is seven-jointed.

Sp. 10. ( ——— ) *Eriphia Fordii*, n. s.

DESCR. *Eriphia* testâ postice fulvomaculatâ regionibus distinctis, lateribus anticè sub-sexspinosis, clypeo haud spinoso, lobis duobus mediis 6-tuberculatis, manibus lèvibus chelis nigris, pedibus hispidis.

NOTE. This species also, like the *Eriphia* in general, has the regions well marked out. The fore margin of the carapace is tubercled, but not so much so as in the *Eriphia Smithii*. The rest of the surface is very finely granulose. The lateral margin has six distinct teeth or spines

before, and some minute tubercles behind. The margin of the orbit is also tuberculated, four of the tubercles becoming almost teeth. The margin of the two middle lobes of the four-lobed clypeus has six tubercles for each. The fore-feet are one larger than the other. Both are almost smooth, although the smaller presents some vestiges of tubercles. The digits of the chelæ are black; those of the larger hand have three teeth above and below; those of the lesser hand being almost without teeth. The feet are without spots or tubercles, but are very hispid. The length is two inches. The abdomen of the female has seven joints.

The two foregoing species of *Eriphia* both come close to their congeners, the *Gegarcinus hirtipes* of Lamarck, and the *Eriphia lœvimanus* of Milne Edwards. But these last species are natives of the Isle of France.

*Sub-genus. CURTONOTUS*, Dehaan.

Sp. 11. (—) *Curtonotus vestitus*, Dehaan.

*Curtonotus vestitus*, Faun. Jap. tab. 5. fig. 3.

This last group appears to be the same as that which is named *Pseudorhombida* by Milne Edwards.

Fam. PORTUNIDÆ, Mihi.

*Sub-genus. ACHELOUS*, Dehaan.

Sp. 12. (—) *Achelous crassimanus*, n. s.

DESCR. *Achelous* testâ glabrâ regionibus distinctis lateribus antice dentatis, clypeo sexdentato, orbitis subtus unidentatis, manibus articulo tertio intus tridentato extus bidentato, quarto supra ad apicem bidentato adque basin unidentato.

NOTE. This large crab has a shell which is about five inches long by seven wide. The teeth of the cephalothorax are triangular, sharp, and nearly equal. The fore feet are nearly equal in size. The abdomen of male has seven joints. It has been only known, as yet, to occur in deep holes, which it makes in the mud islands near the mouth of the Zwartkops River,—islands that are only visible at low water.

*Sub-genus. CHARYBDIS*, Dehaan.

Sp. 13. (—) *Charybdis Smithii*, n. s.

DESCR. *Charybdis* testâ glabrâ, regionibus indistinctis, lateribus antice sexdentatis, clypeo 8-dentato, orbitis haud dentatis, manibus articulo secundo intus tridentato, quarto supra bidentato intus et extus lineis tribus granulatis longitudinaliter carinato, digitis sulcatis.

NOTE. Although I have here placed *Charybdis* as a sub-genus, I suspect that when the family *Portunidæ* is worked out, it will be found that the *Charybdis* of Dehaan is only a section of some sub-genus of the genus *Portuninus*. M. Dehaan is here splitting very fine; for between the groups named by him *Oceanus*, *Charybdis*, and *Thalamita*, the differences are very minute. Our crab comes between *Oceanus crucifer* of Dehaan and his *Charybdis 6-dentatus*. The cephalothorax has no transverse granulated lines like the latter, nor are the teeth of the clypeus blunt like those of *Oceanus crucifer*. The six teeth of the anterior lateral margin are

equal, the tooth nearest the eye being sharp. So are the teeth of the clypeus, and the four middle of these teeth are scarcely separated from the lateral ones by a deeper incision. The fore-feet are equal in size, having two apical teeth on the upper margin of the fourth joint. The length is about two inches. The abdomen of the female has six joints.

### Fam. CARCINIDÆ, Leach.

#### *Sub-genus. ANISOPUS*, Dehaan.

Sp. 14. (—) *Anisopus trimaculatus*, Dehaan.

*Anisopus 3-maculatus*, Faun. Jap. p. 13.

*Platyonychus bipustulatus*, M. E. Hist. Nat. des Crust. vol. i. p. 437. tab. 17.  
fig. 7. 10.

NOTE. This crab has a strong relation to the *Corystidæ*, which Professor Dehaan has pointed out with his usual acumen. By *Anisopus*, in fact, we pass off to the *Corystina* among the Trigonoostomous *Brachyura*.

#### *Sub-genus. XAIVA*, M'L.

*Cephalothorax* rather depressed, as broad as long, but narrower behind, being broadest in the middle, and having the sides in front arched with a five-toothed margin; the tooth behind the eyes being broad and truncated. The sides behind are entire, rather concave, and with a margin. The shell behind is also entire and margined. The clypeus is triangular, advanced with an acute point, and having the sides undated, while it is furnished above on each side at its base with an orbital tooth.

*Orbit* with two teeth below, the outer one of which is triangular, and larger than the other.

*External antennæ* inserted within the orbit, and having their basilar joint short and subtriangular.

*External pedipalpi*, with the second joint, almost twice as long as the third, which is subquadrate, carinated at the base, with the point obliquely truncated, acuminate on the outside; the inner margin having a piece cut out, as it were, above its middle.

*Feet*, first pair with the chelæ bicarinatae above; second, third, and fourth pair with slender nails, while the hind pair has the nails or unguis dilated and pointed as in the genus *Carcinus*.

*Abdomen* of male has seven segments; but the third, fourth, and fifth appear soldered together.

*Xaiva* is the Spanish name for all crabs which have the posterior feet natatory. This will be seen on referring to the curious work of Parra on the natural history of the Gulf of Mexico. The present sub-genus comes close to *Carcinus* of Leach; but is easily distinguished by the third joint of the external pedipalpi.

Sp. 15. (—) *Xaiva pulchella*, n. s.

PL. III.

DESCR. *Xaiva* testâ margine anteriore subreflexo, tuberculis quatuor in regione stomachali, lineâ utrinque elevatâ in tuberculum laterale desinente, chelis suprà bicarinatis et extus tricarinatis.

NOTE. The stomachal region in this pretty little crab is marked by four tubercles, which are situated on an elevated ridge, stretching on each side towards a lateral tubercle, which is almost on the middle tooth of the anterior lateral margin of the shell. The genital region is marked by

two minute tubercles at the base of a longitudinal carina. An irregular transverse carina stretches out on each side from the last lateral marginal tooth towards the middle of the shell, marking out the upper limit of the branchial region. The chelæ are marked above with five keels on the fixed digit, and three or four longitudinal furrows on the middle finger. The second, third, and fourth pair of feet, are compressed, having their third and fourth joints bicarinated, and their unguis furrowed. The fifth pair of feet are less bicarinated, and the last joint or claw is like the posterior claw of *Carcinus mænas*, Leach, only more broad. The length is less than an inch.

8. We now return to the aberrant family *Eriphidae*, by means of which we pass to *Thelphusa* among the *Grapsina*. It becomes therefore necessary to point out the families of a stirps which is very common in warm climates, and the study of whose manners afforded me much amusement whilst I resided in the West Indies. Dr. Milne Edwards calls them *Catamètopes*, and says that some of them are "*complètement terrestres*." This is an error, however; for all these crabs must lay their eggs in water, must pass their infant state in water, and must, during their future life, return periodically to the vicinity of water. The land-crab *par excellence*, *Gegarcinus ruricola*, Lat., in this respect, does not differ in economy from other Brachyurous Decapods, nor does it retire many leagues from the sea. In our small West India islands it may be found all over them; but in Cuba it has its limits, which are confined to a certain distance from the shore.

### Stirps. GRAPSINA, or SQUARE CRABS.

#### Families.

<i>Aberrant Groupe.</i>		
Tigellus of external pedipalps never inserted at the middle of the apex of third joint.	1 THELPHUSIDÆ, M. E. Fresh Water Crabs.	{ Ocular peduncles short. Tigellus of external pedipalps never inserted at the outer angle of third joint. Scape of the palpi undentated on the inside.
	2 GONOPLACIDÆ, M. E. Deep Shore Crabs.	{ Ocular peduncles long. Tigellus of external pedipalps inserted at the inner angle of third joint. Scape of the palpi undentated on the inside.
	3 OCYPODIDÆ, Leach. Low Shore Crabs.	{ Ocular peduncles long. Tigellus of external pedipalps always inserted at the outer angle of third joint. Scape of the palpi not dentated.
<i>Normal Groupe.</i>		
<i>GRAPSI</i> , Dehaan.	4 GRAPSIDÆ, M. E. Salt Water Crabs.	{ Shell depressed, and the whole structure such as to render these crabs unable to retire far from the sea.
Tigellus of external pedipalps inserted at the middle of the apex of third joint. Palpi never dentated.	5 GEGARCINIDÆ, M. E. True Land Crabs.	{ Shell convex in order to contain a certain quantity of water, enabling these crabs to travel great distances on land.

9. Dr. Smith has brought specimens of all the above families of *Grapsina* except of the *Gegarcinidæ*. The first family *Thelphusidæ* has the genital organs of the male placed nearly as in the last stirps *Cancrina*, with which it is osculant. But the other families of *Grapsina* have the genital orifices of the male placed in a transverse groove hollowed out on the sternum. Both the *Thelphusidæ* and *Gonoplacidae* being aberrant families, agree with the *Cancrina* in having the scape of their palpi undentated on the inside.

## Fam. THELPHUSIDÆ, M. E.

*Sub-genus. THELPHUSA*, Lat.Sp. 16. (—) *Thelphusa perlata*, M. E.*Thelphusa perlata*, M. E. Hist. Nat. des Crust. vol. ii. p. 13.

NOTE. This crab is common in all the rivers of southern Africa, and grows to the size of nearly three inches long. The male has a much more convex shell than the female, and in aspect resembles much a *Gegarcinus*. The pearly tubercles of the anterior margin of shell are also still more small and evanescent than in the female. I may take this occasion to observe, that in my cabinet I separate those species of *Thelphusa*, which, like the present, have a transversal crest in front of the shell, and call them *Potamonautes*. They are easily distinguished from true *Thelphusæ*, of which the type is the European species *Thelphusa fluviatilis*.

## Fam. GONOPLACIDÆ, M. E.

*Sub-genus? CLEISTOTOMA*, Dehaan.Sp. 17. (—) *Cleistotoma Edwardsii*, n. s.

DESCR. *Cleistotoma* oculis magnis, testâ lèvi haud pilosâ lateribus integris nec granulosis nec postice divergentibus, manibus brevibus; pedum pari tertio longiori, femoribus infra lèvibus.

NOTE. This species comes very near to the *Cleistotoma Leachii* of Milne Edwards; but differs from it in the surface being altogether smooth. The length is four lines.

## Fam. OCYPODIDÆ, Leach.

*Sub-genus. OCYPODE*, Fab.Sp. 18. (—) *Ocypode cordimana*, Lat.*Ocypode cordimana*, M. E. Hist. Nat. des Crust. vol. ii. p. 48.

NOTE. The *Ocypode cordimana* of Dehaan appears to be a very different species.

*Sub-genus. CERATOPHTHALMA*, Dehaan.Sp. 19. (—) *Ceratopthalma cursor*, Herbst.*Cancer cursor*, Herbst. vol. i. tab. 1. fig. 8 and 9.*Sub-genus. GELASIMUS*, Lat.Sp. 20. (—) *Gelasimus chlorophthalmus*, M. E.*Gelasimus chlorophthalmus*, M. E. His. Nat. des Crust. vol. ii. p. 54.

## Fam. GRAPSIDÆ, M. E.

*Sub-genus? GNATHOCHASMUS, M'L.*

*Cephalothorax* sub-quadrata, with the back convex, and entire sides which are arched towards the eyes; the clypeus between the eyes is plane, entire, truncated and deflexed.

*Exterior Antennæ* produced as far as the middle between the eyes, and having the first joint transverse.

*External Pedipalpi* very distant from each other; with the second joint very oblique at the base, at the point sinuated, and of the same length as the third joint, which is concave in the middle, and has a bearded crest continuous along its inner edge as far as the outer part of the base of the second joint.

*Feet;* first pair with thick and equal chelæ.

*Abdomen* in both sexes has seven segments.

10. Dehaan has noticed the affinity between the two groupes, which he names *Chasmagnathus* and *Pachysoma*. By them he passes from the family *Ocypodidæ* to the family *Grapsidæ*. The sub-genus or sub-section which I have just characterized under the name of *Gnathochasmus* comes exactly between *Chasmagnathus* and *Pachysoma*. It agrees with both in the remarkable elevated crest, which stretches down obliquely from the inner angle of the third joint of the external pedipalp to the outer angle of the base of its second joint. It has the thorax with arched sides, like those of *Chasmagnathus*; but then these sides are entire, like those of *Pachysoma*. I may here observe, that Dehaan's name *Pachysoma* ought to be changed, as it was assigned, long ago, by Mr. Kirby, to a division of the genus *Scarabæus*. See Horæ Entomologicae, part 2, p. 507.

Sp. 21. (—) *Gnathochasmus barbatus*, n. s. *Pl. IV.*

DESCR. *Gnathochasmus* testâ lœvi, utrinque ad oculos deflexâ regionibus sub-distinctis, lateribus clypeoque marginatis integris; manibus lœvibus glaberrimis crassis chelis sub-concoloribus latis convexis, pedibus lœvibus sub-compressis nigro-punctatis tarsis sulcatis.

NOTE. This crab is about an inch and a quarter long.

*Sub-genus. SESARMA, Say.*

Sp. 22. (—) *Sesarma reticulata*, *Say.*

*Grapsus cinereus*, *Bosc. Hist. Nat. des Crust.* vol. i. p. 204. tab. 6. fig. 1.  
*Sesarma reticulata*, *Say, Trans. Acad. Phil.* vol. i. p. 73. tab. 4. fig. 5.

NOTE. It is singular that I can find no good character whereby to separate this Cape crab from the American species described by Bosc and Say. The latter, however, I only know from description. It is six lines long, whereas the Cape crab is more than an inch. Both are distinguished from the *Sesarma quadrata* by their epistome being covered with granulations, so as to appear finely reticulated. I dare say if we could compare the two crabs together we should be able to discover a specific difference. The Cape crab has not the slightest vestige of granulation on the shell of the cephalothorax. I have found in Cuba the species of *Sesarma* to live generally under stones on the banks of the muddy mouths of rivers. Say's name, *Sesarma*, is adopted

by me instead of *Pachysoma*. It distinguishes a group which is the most quadrilateral form of the family *Grapsidae*, and easily known from the true *Grapsus* by its sides deflexed vertically, being parallel to each other from the eyes. In the Cape species the clypeus has four lobes, the two middle ones being separated by a deep furrow.

*Sub-genus. PLAGUSIA*, Lat.

Sp. 23. (—) *Plagusia tomentosa*, M.E.

*Plagusia tomentosa*, M. E. Hist. Nat. des Crust. vol. ii. p. 92.

NOTE. In the younger specimens of this species the feet are wholly tomentose; but in the more adult specimens we find the two ridges of the upper side of the second joints of the feet appearing white, from the tomentum being worn off.

Sp. 24. (—) *Plagusia spinosa*, n. s.

DESCR. *Plagusia* testâ subtomentosâ valde depressâ, longiore quam latâ, lateribus arcuatis antice quadridentatis, clypeo medio angusto quadridentato dentibus mediis porrectioribus, clypei lateribus bidentatis, manibus brevissimis gracilibus, pedibus articulis secundis extus spinosis, pari secundo longiore.

The length of this *Plagusia* is about three quarters of an inch. It comes very near to the *Plagusia clavimana* of Desmarest.

*Sub-genus. GONIOPSIS*, Dehaan.

Sp. 25. (—) *Goniopsis strigosa*, Herbst.

*Cancer strigosus*, Herbst. tab. 47. fig. 7.

Sp. 26. (—) *Goniopsis flavipes*, n. s.

DESCR. *Goniopsis* testâ glaberrimâ nitidâ nigrolividâ lateribus antice bidentatis, epistomate brevissimo cristâ utrinque transversâ tuberculatâ, manibus sanguineis bicarinatis, pedibus flavis nitidissimis.

NOTE. This species is nearly three inches long, and very handsome. The manners of the various species of *Goniopsis* are very interesting. There are no crabs more active, more vigilant, or more beautiful. The type of this genus is the *Grapsus ruricola* of Degeer, a crab whose manners are detailed by me in the first volume of the Transactions of the Zoological Society. The name, *Grapsus ruricola*, Deg., was wrongly altered from my manuscript by some person who superintended the press during my absence at the Havana, and changed the name to *Gegarcinus ruricola*, Desm. The *Grapsus ruricola*, Deg., is the *Grapsus cruentatus* of Latreille, and the true *Crabe des Paletuviers* of French travellers, although Milne Edwards erroneously makes this to be the *Goniopsis picta*, a species which on the contrary is always found on reefs, and which is therefore by Parra called “*Cangrejo de Arrecife*”

*Sub-genus. NAUTILOGRAPSUS*, M. E.

Sp. 27. (—) *Nautilograpsus major*, n. s.

DESCR. *Nautilograpsus* testâ depressiusculâ longiore quam latâ, antice lœvi, lateribus posticè rugis transversis, margine antico pone oculos subemarginato, clypeo lato ultra laterum angulos porrecto.

NOTE. This species is ten lines long by seven wide; whereas the true *Nautilograpsus minutus*,

the *Cancer minutus* of Fabricius, of which I have taken abundance in the Atlantic ocean, adhering to the gulf-weed, is only three lines long.

Sp. 28. (—) *Nautilograpus Smithii*, n. s.

DESCR. *Nautilograpus testâ convexâ lævi*, tam latâ quam longâ, margine laterali antico pone oculos vix emarginato, clypeo lato vix ultra laterum angulos porrecto.

NOTE. This species is seven lines long, and as broad as long. I believe that many species of this sub-genus are confounded with the *Cancer minutus* of Fabricius. *Nautilograpus* is an excellent groupe, which appears to have escaped the notice of M. Dehaan. It is in general found in the wide ocean, adhering to chelonian reptiles or masses of floating sea-weed. The feet therefore are almost natatorial. *Grapsus pusillus* of Dehaan appears to be a species of the sub-genus near to *Nautilograpus major* above described.

*Sub-genus. GRAPSILLUS*, M'L.

*Cephalothorax* heart-shaped, depressed, with the back plane and the sides arched, almost forming the quadrant of a circle; the clypeus is broad, truncated, and sinuated in front.

*Orbits* placed at the fore angles of the shell, with great depressed eyes.

*Exterior Antennæ* placed without the orbit towards the middle of the clypeus.

*Internal Antennæ* rather thick.

*External Pedipalpi* with the second and third joints quadrate, almost equal, the third being a little shorter; the third joint also has its inner apex rounded off, the tigellus is thick, and the outer palpus has its sides almost parallel.

*Feet*; first pair almost twice as long as body with very large joints; the chelæ being without teeth and the other feet being short with hairy tarsi.

*Abdomen* in males has five segments, in females it has six.

11. This groupe is very distinct from any described one with which I am acquainted. It approaches in many respects to *Nautilograpus*, and appears to connect that groupe with *Plagusia*. It is remarkable for the large size of the fore feet.

Sp. 29. (—) *Grapsillus subinteger*, n. s.

DESCR. *Grapsillus testaceus*; thoracis lateribus versus medium vix emarginatis; clypeo medio emarginato denteque utrinque ad oculos obtuso; manibus articulo secundo intus tridentato, chelis apice purpureis ad marginem unistriatis.

NOTE. This species is about four lines long, and rather broader than long.

Sp. 30. (—) *Grapsillus dentatus*, n. s.

PL. 277

DESCR. *Grapsillus rufo-testaceus*; thoracis lateribus medio unidentatis, dente acuto; clypeo medio sub-bilobo denteque distincto utrinque ad oculos obtuso; manibus articulo secundo intus septem-dentato, chelis apice sub-purpureis ad marginem unistriatis.

NOTE. This species is about half an inch long, and about the same width.

Sp. 31. (—) *Grapsillus maculatus*, n. s.

DESCR. *Grapsillus testaceus suprâ et infra rufo-maculatus maculis rotundis*; thoracis lateribus medio unispinosis, spinâ brevi acutâ; clypeo medio sub-bilobo utrinque ad oculos emarginato;

manibus articulo secundo intus quinque-dentato, chelis apice concoloribus ad marginem  
haud striatis.

NOTE. This beautiful little species is four lines long, by more than five broad.

12. The above great number of *Grapsidæ* at the Cape shews that the carcinology of South Africa agrees with that of intratropical climates more than it does with that of the temperate zones in general. But we now proceed to the stirps *Pinnotherina*, and for that purpose we must return to the family *Ocypodidae*. Milne Edwards has shewn that a small crab of the Red Sea, called by him *Doto sulcatus*, makes the passage from the *Ocypodidae* to the *Pinnotherina*.

#### Stirps. PINNOTHERINA, Dehaan, or PARASITICAL CRABS.

13. This stirps contains so few known species, that I shall not attempt its arrangement at present, more particularly as Dr. Smith has only brought home one species, which has long been known as a native of the Cape of Good Hope. M. Dehaan makes the distinguishing characteristic of this stirps, which he calls *Pinnotheridea*, to consist in the sixth joint of the fourth pair of maxillæ being inserted at the base of the fifth joint. The groupe consists of singular crabs, among which we find the last pair of feet to be sometimes evanescent, as in the genus *Hexapus* of Dehaan.

#### Fam. HYMENOSOMIDÆ.

*Genus. HYMENOSOMA*, Leach.

*Sub-genus. LEACHIUM*, M. E.

Sp. 32. (*Hymenosoma*) *Leachium orbicula*: Leach, MSS.

*Hymenosoma orbiculare*, Desm. Cons. p. 163. tab. 26. fig. 1.

NOTE. Milne Edwards has shewn that the *Hymenosoma Leachii* of Guerin belongs to another sub-genus.

14. Perhaps when the attention of collectors shall have been more directed to these small, though curious crabs, we may discover their natural arrangement. The difficulties pointed out by Milne Edwards, who complains that his genera are so distinct from each other, evidently proceeds from almost every one of his genera belonging to a distinct family. Perhaps indeed, if we consider his arrangement in this light—in other words, that most of his genera represent families—the table he gives (vol. 2, p. 29) may not be found so far wrong. But however this may be, I shall now return to the stirps *Cancrina* and family *Carcinidæ*. From these we pass directly to the osculant stirps *Corystina*, belonging to the interesting tribe of Trigonostomous *Brachyura*, which may be displayed to view in the following manner:—

## Tribe. TRIGONOSTOMA.

## Stirpes.

<i>Aberrant Groupe.</i>	1 CORYSTINA.	External antennæ long. Hind feet of the more usual structure, and serving for locomotion. Oral orifice triangular.
<i>MACROCERA.</i>	2 DORIPPINA.	External antennæ long. Hind feet raised up over the back and serving for organs of prehension. Oral orifice triangular.
External antennæ long, or at least conspicuous.	3 DROMIINA.	External antennæ moderate. Hind feet raised up over the back and serving for organs of prehension. Oral orifice not always triangular.
<i>Normal Groupe.</i>	4 LEUCOSINA.	Anterior feet not elevated into a crest. No branchial afferent apertures in front of the fore feet.
<i>BRACHYCERA.</i>	5 CALAPPINA.	Anterior feet compressed and elevated into a crest. Branchial afferent apertures in front of fore feet.
External antennæ more or less rudimentary and always inconspicuous.		

15. From the *Corystina* we pass to the *Calappina*, by means of *Matuta*. By *Oreophorus* we leave the *Calappina* for the *Leucosina*. The passage from the *Leucosina* to the *Dromiina* is not so clear; but these last are close to the *Dorippina*, which last again are approximated naturally to the *Corystina*. Still the tribe has never been worked out, and I think it more than possible that the *Dromiina* which I have here considered to be an aberrant groupe of Trigonostomous *Brachyura*, will, in the end, be found to be an aberrant groupe of Anomurous *Macroura*. Nay, this last is the position assigned to it by Milne Edwards, and the arguments for such a location of *Dromiina* are their rudiment abdominal appendages, and the oral orifice being rarely triangular. On the other hand, however, they differ from all *Macroura* in having fossulae for the reception of their internal antennæ. The question therefore of their true place can only be determined when the groupe shall have been worked out, which I fear cannot be done at present, on account of the paucity of species which are known to belong to this essentially tropical tribe. One thing, nevertheless, is established, namely, that the *Dromiina* are osculant, or, in other words, they stand on the limits of the Trigonostomous *Brachyura* and Anomurous *Macroura*. Into which of these circles the stirps truly enters, must be left for future investigation; but I shall provisionally consider it as belonging to the *Brachyura*. As for the families of Trigonostomous *Brachyura*, I shall not at present attempt to indicate them, but proceed at once to characterize the sub-genera brought from the Cape, which are only three.

## Stirps. CORYSTINA.

Of the stirps *Corystina* we have no species from the Cape; but the following is very close to it, being aberrant in the next stirps.

## Stirps. CALAPPINA.

## Fam. MATUTIDÆ.

## Genus. MATUTINUS.

## Sub-genus. MATUTA, Fab.

Sp. 33. (Matutinus) Matuta Victor, *Fab.*

*Matuta vitor*, M. E. Hist. Nat. des Crust. vol. ii. p. 115. tab. 20. fig. 3 and 6.

NOTE. I agree entirely with my lamented friend Dr. Leach in thinking, that there are many species confounded together under the name of *Matuta vitor*. I do not consider the above names of the family and genus to possess any authority, and merely publish them in order that the reader may understand the relation which the sub-genus bears to the stirps *Calappina*.

## Stirps. LEUCOSINA.

Here likewise I shall not pretend to characterize the families, or to describe the genera of a stirps in which so few species are as yet known; but shall merely content myself with the following description of the only sub-genus of the groupe which is known to be found at the Cape of Good Hope :—

## Sub-genus. LEUCISCA, M'L.

*Body* in front slender and compressed, but behind thick.

*Cephalothorax* smooth, plane, depressed, sub-elliptical, broader than long, and having a thin reflexed margin; while the clypeus is advanced with a round sub-reflexed apex, which is scarcely emarginate.

*Orbits* small, sub-circular, and hidden under the clypeus; while the eyes are deeply set, very minute and globose.

*Exterior Antennæ* very small and rather tri-articulate.

*Interior Antennæ* hidden under the clypeus in transverse reniform fossulæ.

*External Pedipalpi* very large, and closing a triangular buccal cavity; their second joint is oblong, quadrate, and broader in front than the third, which is triangular, with a sharp point, while the external palpus is lunate.

*Feet*; first, second, and third pairs have been lost in the only specimen before me; but the two remaining pair are short, and all are inserted under the margin of the cephalothorax.

*Abdomen* of the female with four segments.

The nearest crab to this is one from the Red Sea, which is described by Rüppell under the name of *Oreophorus horridus*. Both come near to *Calappina*.

Sp. 34. (———) *Leucisca squalina*, n. s. *PL. III*

DESCR. *Leucisca* alba, dorso medio convexiusculo, oculis glaucis, pedipalpis exteris palpisque margine externo granulatis, pedibus articulo quarto extus sulcato, unguibus longis acutis.

NOTE. The length of this curious little crab is only about three lines; and my specimen is much injured, having lost the chelæ, and several other of the feet. The abdomen also is in a damaged state.

## Stirps. DROMIINA.

*Sub-genus. DROMIA*, Fab.

Milne Edwards has described the form of this sub-genus in one of its early stages of metamorphosis, and has also very distinctly pointed out the various points in which the adult state of *Dromia* differs from that of the *Brachyura* in general.

SP. 35. (—) *Dromia hirtissima*, Lam.

*Dromia hirtissima*, Lam. Hist. Nat. des An. sans Vert. vol. v. p. 264.

SP. 36. (—) *Dromia rotunda*, n. s.

DESCR. *Dromia villosa*, minime tuberculata, tam longa quam lata, globosa regione hepaticâ fos-sulâ obliquâ utrinque munitâ, lateribus anticis haud dentatis, clypeo antice bidentato.

NOTE. This species comes very near one from the Red Sea, described by Rüppell under the name of *Dromia unidentata*; but the anterior sides of the shell have not an unidentated margin. The crab is all, except the tips of the fore feet, covered with a close, short, brown tomentum. The shell is round, with a convex globular back. Besides the two middle triangular teeth of the clypeus, there is a short blunt one above the inner side of the orbit, and vestiges of another blunt tooth above the outer side. The length is about sixteen lines.

Dr. Smith has brought no species of the stirps *Dorippina* from the Cape.

## ON A NEW SPECIES OF CERAPTERUS.

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THE addition of a new species to so rare a genus as *Cerapterus* will confer entomological fame on Dr. Smith's expedition. The genus *Cerapterus* is so little understood by entomologists, that ere I describe this new species I conceive myself called upon to make a few remarks on the groupe, particularly as those hitherto made have either been extremely inaccurate, or have been accompanied by bad figures.

The genus *Cerapterus* was founded by Swederus fifty years ago, and the insects having immediate reference to it remain to this day of the utmost rarity; so much so, indeed, that I believe there is no specimen in any Continental Museum. There are only five specimens in England, and each of these belongs to a distinct species. Of these five specimens, three are in my collection, one in that of the East India Company, and one in that of Mr. John Curtis. Having the first four species now on the table before me, I consider myself enabled to distinguish the species accurately; and I shall take the opportunity of stating some interesting particulars observed by my brother, Mr. George MacLeay, in New South Wales, which agree with the observations made by M. Verreaux on the economy of the *Paussidæ* in general,—a family of which he has brought home a very extensive collection.

Being in possession of a fine series of undescribed *Paussidæ*, and finding some very curious forms among them, I shall probably hereafter treat of the family at large in some other work. My object for the present must be confined to a satisfactory description of Dr. Smith's new species. I shall therefore in this place merely remark, that if we watch that chain of affinity which is most visible in the family of *Paussidæ*, some genera that are usually included in it will seem, so far as we are acquainted with the groupe, to be more properly excluded. For instance, beginning with the true genus *Paussus*, we pass, by an easy transition, to the groupe called *Platyrhopalus* by Mr. Westwood, and to that interesting insect *Platyrhopalus Mellyi*, which appears to be the type of a new sub-genus leading us on directly to *Cerapterus latipes* of Swederus; and by the New Holland form of *Cerapterus* which I call *Arthropterus*, we pass to *Pentaplatarthrus*, from which we return to *Paussus*. Now, as this returning into itself is the essential characteristic of a natural groupe, it follows that the genus *Hylotorus* of Dalman, as well as the *Trochoideus* of Westwood, are osculant groupes, leading off from the *Paussidæ*, since if inserted in the above circular series, they appear to interrupt it. If indeed Dalman's name *Hylotorus* be correctly applied, this insect cannot enter into the groupe of true *Paussidæ*, which, according to the observations of M. Verreaux, never attack wood. As to the genus *Trochoideus*, which, by the way, is strangely named; for the insects are as like to Hercules as to a wheel; it certainly leads off to the parasitical *Myrmecoxenus* of

Chevrolat, and other genera, such as *Cryptophagus*, of the group which I have called *Necrophaga*. Mr. Westwood seems to have been the first to suspect the affinity of *Cryptophagus* to the *Paussidæ*, but he has not expressed himself very clearly on the subject. With respect to the true affinities of *Hylotorus*, having never seen the insect except as figured by Schönnherr in his appendix, I am unwilling to offer an opinion; although, if Dalman's name has been given to the genus on account of its habits, I suspect that good reasons may hereafter be found for this last entomologist's assertion, that it bears some kind of relation to *Platypus*. One thing, however, is sure, namely, that the *Paussidæ* have a strong relation of analogy to the *Pselaphidæ*; so strong indeed, that I at one time suspected immediate affinity. But I shall return to this subject anon.

I have taken care that figures of the greatest accuracy, and made under my own superintendence, should be executed by Mr. C. Curtis, an artist whose skill in such subjects is only rivalled by that of his brother. I wished also to render the following observations still more complete, by presenting entomologists with the anatomy of the mouth; but as I hope soon to have several specimens at my disposal for dissection, I am unwilling to sacrifice valuable insects, which are, so far as I know, at present unique in my cabinet.

Those persons who may wish to possess some notion of the actual state of our knowledge with respect to *Cerapterus*, will do well to cast their eye over a paper on *Paussidæ*, published in the 16th volume of the Linnean Transactions. It would be unjust to a clever entomologist, Mr. Westwood, did I not praise the industry with which he has there brought together almost every word that has been written on these rare insects. I trust he will now confer a further favour on the entomological world, by condensing the materials he has so laboriously compiled, and by arranging his own valuable observations in a lucid order. His reasoning, however, ought all to be unsparingly expunged; for Mr. Westwood, when he draws an inference, is even more awful than when he names his *Paussi*.\*

In the *Cerapterus* of authors I can clearly discern two very distinct sub-genera. But I shall first state the external characters common to both. They are as follow:—

*Antennæ* pubescentes capitis fronti insertæ, 10-articulatae articulo primo augustiore compresso apice emarginato reliquis sub-perpendiculari, articulo ultimo apice semicirculare, antennæ totius partem fere quartam plerumque constitutæ articulorumque intermediorum latitudine gaudente, his æqualibus brevibus compressis latissimis subparallelis. *Caput* subtriangulare collo cylindrico instructum. *Oculi* globosi valde prominuli. *Thorax* planiusculus immarginatus. *Scutellum* triangulare. *Elytra* oblongo-quadrata. *Pedes* valde compressi, lati. *Tarsi* tetrameri, filiformes articulo ultimo longiore simplices. *Ungues* simplices.

Such insects are peculiar to the tropics of the Old World and to New Holland, and I distribute them as follows:—

*Sub-genus. CERAPTERUS*, Swederus.

*Caput* thorace angustius, collo brevi, oculis mediocribus. *Thorax* latior quam longus lateribus dilatatis rotundatis. *Scutellum* mediocre. *Elytra* abdomine vix breviora

\* For instance, he has attempted to prove, although I know not how, that the *Paussi* presented to Latreille by my father, were given to the latter out of the Linnean Collection by its purchaser, Sir J. E. Smith. Mr. Westwood accordingly vents a great deal of virtuous indignation, which however is all wasted, as my father never received an insect in his life from Sir James Smith; and I must say it is rather hard that the late President of the Linnean Society should be so unjustly attacked in the Transactions of an Institution which he founded.

*lata*, apice subrotundata. *Tibiae* lateribus parallelis apice truncatis haud bispinosis. *Tarsi* intra tibiarum apices excavatos retractiles.

This group is found in Asia and Africa, within the tropics.

Sp. 1. (———) *Cerapterus latipes*, *Swed.*

DESCR. *Cerapterus piceus*, elytris maculâ apicali flavescente subrotundâ antice quadridentatâ postice lobatâ, antennis rufis articulo ultimo in tuberculum ad basin elevato.

*Caput* piceum. *Thorax* capite duplo latior, medio posticèque utrinque foveolatus. *Antennæ* lateribus convergentibus serratis, articulo ultimo quatuor precedentibus simul sumptis longiore. *Elytra* thorace vix latiora. *Tibiae* rufæ, latissimæ, apice haud spinosæ.

*C. latipes*, *Swed.* K. V. Acad. vol. ix. p. 203. tab. 6. fig. 1.

NOTE. The original specimen which General Davies sent to Swederus for description is now in my collection, my father having purchased it at the sale of the General's museum. It is supposed to be a native of the East Indies, which is more than probable, as it comes very close to the Javanese species hereafter described.

Sp. 2. (———) *Cerapterus Horsfieldii*.

DESCR. *Cerapterus piceus*, thorace antice emarginato, elytris maculâ apicali flavescente haud rotundatâ literam Y quadammodo simulante.

*Caput* nigropiceum antennis rufo-ferrugineis lateribus parallelis vix serratis, articulo basilari lobato, ultimo quinque precedentibus simul sumptis longiore. *Thorax* capite triplo latior, postice utrinque subfoveolatus. *Elytra* thorace latiora. *Tibiae* rufæ apice haud spinosæ.

*C. latipes*, West. Trans. Linn. Soc. vol. xvi. p. 682. tab. 33. fig. 52—56.

*C. Horsfieldii*? West. Trans. Linn. Soc. vol. xvi. p. 672.

NOTE. The only specimen known of this insect was brought by Dr. Horsfield from Java, and deposited by him in the museum of the East India Company. It was first described by Mr. Westwood, who imagined it to be a variety of *Cerapterus latipes*. He proposed, however, if it should eventually be proved different, that it should be called *C. Horsfieldii*; and this proposal I have had great pleasure in adopting, out of respect for the profound entomological science of Dr. Horsfield. The figure given in the Linnean Transactions of this interesting insect is so incorrect, that I have, with Dr. Horsfield's kind permission, employed Mr. C. Curtis to make an accurate one for the satisfaction of entomologists. The size is that of the former species, that is, rather more than five lines.

Sp. 3. (———) *Cerapterus Smithii*, *n. s.*

DESCR. *Cerapterus nigropiceus* subnitidus, clytris maculâ fulvâ lunari, tibiis intus spinâ apicali instructis.

*Caput* piceum subpunctatum. *Antennæ* nigropiceæ lateribus convergentibus vix serratis, articulo ultimo plano tribus precedentibus simul sumptis haud longiore. *Thorax* capite haud duplo latior. *Elytra* oblongo-quadrata thorace latiora et fere quintuplo longiora apice rotundata abdome haud breviore. *Pedes* nigropicei.

NOTE. For an unique specimen of this African species I am indebted to the kindness of Dr. Smith, who found it within the tropic of Capricorn. It is by far the largest of the *Paussidæ* known, and differs from the two former species of *Cerapterus* in having a spine at the extremity of the tibia. It seems to form a distinct section of *Cerapterus*.

*Sub-genus. ARTHROPTERUS, M'L.*

*Caput* thorace haud augustius, collo conspicuo, oculis magnis. *Thorax* longior quam latus, sub-quadratus. *Scutellum* minimum. *Elytra* angusta parallela, apice truncata ab domine breviore. *Tibiæ* lateribus haud parallelis apice bispinosus. *Tarsi* intra tibiarum apices excavatos haud retractiles.

This group inhabits New Holland.

Sp. 1. *Arthropterus MacLeaii, Don.*

DESCR. *Arthropterus rufo-brunneus*; thorace subconvexo posticè augustiore, augulis anticis rotundatis, disco medio vix canaliculato.

*Caput* subpunctatum thorace latius. *Antennæ* lateribus parallelis haud serratis, articulo ultimo plano tribus precedentibus simul sumptis vix longiore. *Thorax* angustus, antice latior angulis anticis rotundatis, posticis acutis. *Elytra* thorace latiora, et non triplo longiora, oblongo-quadrata lateribus parallelis. *Pedes* rufo-brunnei.

*Cerapterus MacLeaii, Don.* Ins. of New Holland, pl. 3.

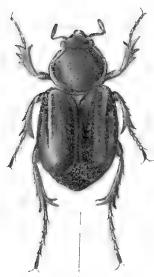
NOTE. The only specimen known of this species was purchased by my father at the sale of Mr. Francillon's museum. None of the authors who have written on the species ever saw it, except Donovan, who was its first describer in his work on the "Insects of New Holland." There is another species of *Arthropterus*, which I have seen in the valuable collection of my friend Mr. John Curtis, and which differs from *A. MacLeaii* in the form of the thorax, and in the body being more depressed. I am ignorant which of these two my brother, Mr. George MacLeay, has lately found, or whether his discovery may not prove, on comparison, to be still a third species. But I learn, by a letter from my father, that my brother, "in one of his late excursions into the interior of New South Wales, discovered several specimens of 'Cerapterus MacLeaii' in the nests of ants, and, moreover, remarked, that when alive they had the power of exploding, after the manner of *Brachini*." The first of these observations with respect to the economy of *Arthropterus* agrees perfectly with what M. Verreaux noticed of the *Paussi* of the Cape; and my brother's second observation accords with that of M. Dupont's correspondent on the Senegal species, *Paussus excavatus*. I hope, however, as I am about to visit Australia, soon to be able to make myself master of the economy of these interesting insects, and also to publish a correct representation of the parts of their mouth.



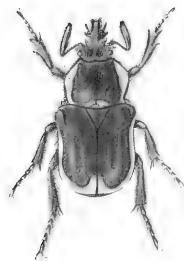
( Invertebrata. Plate I. )



*Citocoris lemnoides*



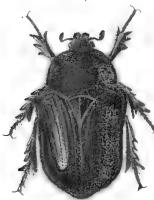
*Campulipus hersfieldii.*



*Ischnostoma piceum*



*Goliathus Smithii.*



*Anaplocheilus spinitarsis.*



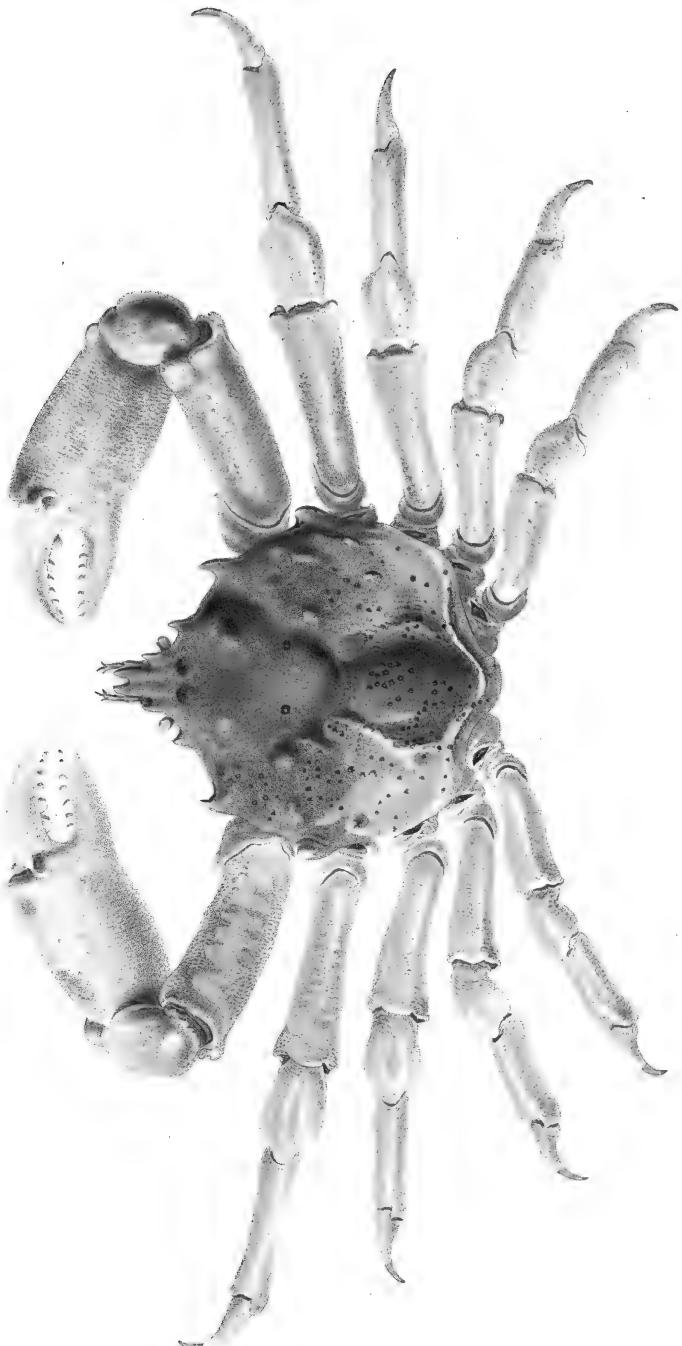
*Ischnostoma spatulipes*

*Fig. a, hind leg.*

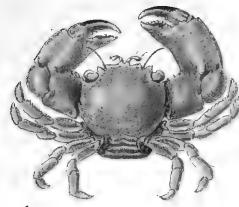


Invertibrata. — Plate 2.

*Astacoides*. *Nudipes*.







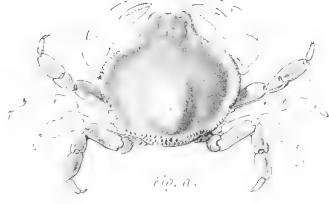
*Grapsillus dentatus.*



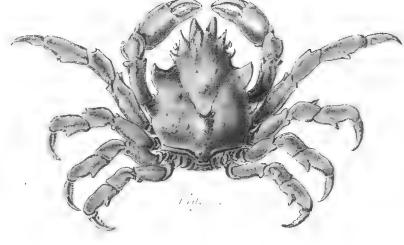
*Cidaris palliolla.*



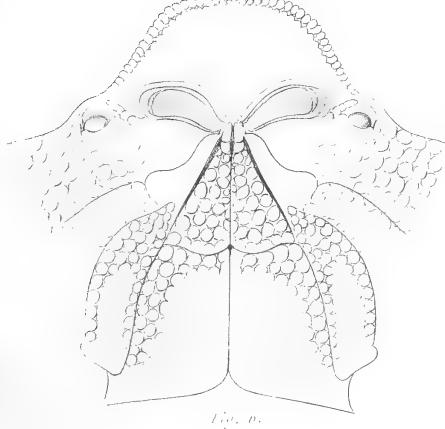
*Guathochasmus variolosus.*



*Fig. a.*

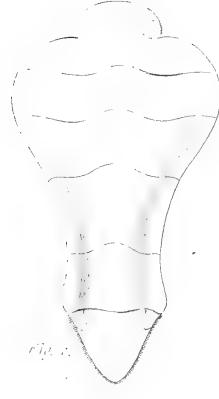


*Fig. b.*

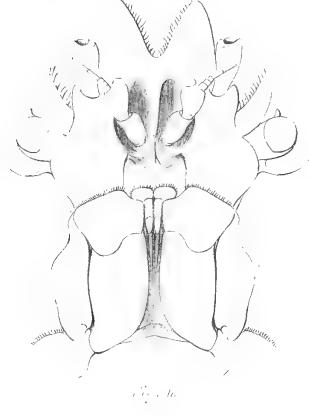


*Fig. a.*

*Fig. a. Leucosca squalina magnified.*  
*Fig. b. Under surface of head.*



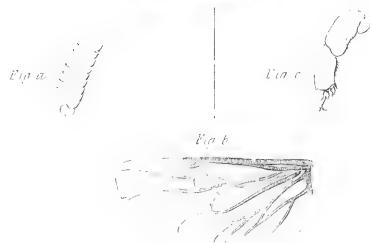
*Fig. b.*



*Fig. a.*

*Fig. a. Dehaanius acanthopus magnified.*  
*Fig. b. Under surface of head, Fig. c. Abdomen of Male.*

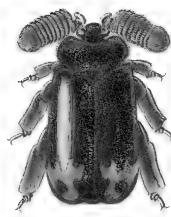




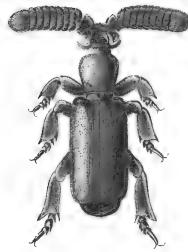
*Cerapterus Smithii.*

Fig. a antenna. Fig. b wing.

Fig. c fore foot.



*Cerapterus Herscieldii.*



*Cerapterus latipes.*

*Arthropterus Macleayi*

Fig. a antenna

John  
Hancock



## PROSPECTUS.

THE Cape of Good Hope is now acknowledged to be one of the greatest avenues as yet opened for the researches of the Naturalist. Our Colony in that part of Southern Africa is the key to a large portion of an extensive continent which is still but very partially explored; and the field to which it admits the scientific traveller is rich to exuberance in the variety and novelty, both of animal and vegetable life.

Stimulated by the prospect of Discovery in a quarter so fertile in interest, "*The Cape of Good Hope Association for Exploring Central Africa*" was established in 1833; and in 1836, an Expedition fitted out by that body, consisting of thirty-four persons, and directed by Dr. Smith, after an absence of nineteen months, and penetrating as far as 23° 28' South latitude, returned to Cape Town laden with a variety of curious and important specimens in Natural History, &c.

Previously to this period little information has been furnished, in a shape calculated to enable the public to form accurate ideas of the various animated beings by which these regions are inhabited. The splendid publication of Le Vaillant, no doubt, should be mentioned as forming an exception, *pro tanto*; but this includes only a portion of the Birds of the most southern extremity of the country, and a work therefore extensive enough to comprehend the various departments of Zoology is still a desideratum.

The Members of *The Cape of Good Hope Association for Exploring Central Africa* found themselves, on the return of the recent Expedition, in a situation to supply at least some portion of the existing deficiencies; but their funds, even if it had been possible to divert them to such an object, were altogether inadequate to defray the expense of laying the result of their labours before the world. Under such circumstances, it was decided that Dr. Smith, the director of the Expedition, should be authorised, on his arrival in England, to wait upon Lord Glenelg, for the purpose of making him acquainted with the position and views of the Society, in the hope that Government might be induced to assist in the publication of their materials.

This hope has not been disappointed. At the recommendation of the Secretary of State for the Colonial Department, the Lords Commissioners of Her Majesty's Treasury have been pleased, by a pecuniary grant, to enable the Society to publish the result of its labours, without infringing upon the funds raised solely for the purposes of discovery; and in a form which, while it places the work within reach of most of the friends and promoters of science, will not, it is hoped, be found inconsistent with the interest and importance of the subject.

The materials for the work now offered, under such patronage, to the public, will consist of pictorial illustrations of between three and four hundred subjects of the animal kingdom, all of which have been collected to the south of 23° 28' South latitude; and will comprise,

First, and principally, unknown animals;

Secondly, animals known, but not yet figured; and

Lastly, such as have been imperfectly figured; but of which the Society is in possession of accurate drawings.

The Entomological portion of the work will be from the pen of W. S. Macleay, Esq., who has kindly undertaken that department. The rest of the descriptions will be furnished by Dr. Smith, who will add a summary of African Zoology, and an inquiry into the Geographical ranges of species in that quarter of the Globe.

### Conditions of Publication.

The Work will appear periodically; and it is estimated that the whole will be completed in about thirty-four parts. As it will be necessary that the plates be published promiscuously, they will be arranged in five divisions, viz. MAMMALIA, AVES, PISCES, REPTILIA, and INVERTEBRATÆ. The plates of each of these divisions will be numbered independently, and the letter-press descriptions left unpag'd, so that on the work being completed, they may be arranged either agreeably to the general classified order which will accompany the last number, or according to the particular views of the purchasers.

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The whole of the Plates will be engraved in the highest style of Art, from Drawings taken expressly for this Work, and beautifully coloured after Nature.

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